



April 15, 2015
Project No. 8128.01.08

Mr. Dana Bayuk
Oregon Department of Environmental Quality
2020 SW 4th Avenue
Portland, Oregon 97201-4987

Re: Monitoring Wells WS-11 and WS-14 Abandonment Report
Siltronic Corporation
7200 NW Front Avenue, Portland, OR
ECSI No. 183

Dear Dana:

On behalf of Siltronic Corporation (Siltronic), Maul Foster & Alongi, Inc. (MFA) has prepared this letter documenting the abandonment of nested monitoring well pairs WS-11 and WS-14 at the Siltronic property.

Direction to abandon WS-14 was provided in DEQ's January 28, 2014, e-mail correspondence to Siltronic documenting a January 27, 2014, telephone conversation. An initial version of the work plan was submitted to DEQ on February 14, 2014, to which DEQ responded in an e-mail dated April 10, 2014. DEQ's April 10 e-mail informed Siltronic that there were insufficient details regarding the well abandonment procedures and provided their approval to proceed with the well inspection video logging for WS-14-125/161 to support scoping and planning of the abandonment work.

The video logs were submitted to DEQ on April 25, 2014 and show the joints in the WS-14 well pair to be intact. The video logs also documented the entry of dense, non-aqueous phase liquid (DNAPL) characteristic of manufactured gas plant (MGP) operations in portions of the well screens, and accumulation of MGP waste DNAPL in the well sump of WS-14-125. At that time, only the WS-14 well pair was scheduled for abandonment. In a DEQ e-mail dated June 25, 2014, DEQ responded with comments and directed Siltronic to also abandon well pair WS-11-125 and WS-11-161.

MFA incorporated DEQ comments in a revised work plan submitted on July 25, 2014. On September 18, 2014, DEQ responded with comments in a letter regarding "Abandonment of the WS-11 and WS-14 Monitoring Well Clusters and Installation of a Deep Monitoring Well" and requested that a revised work plan be submitted to DEQ by October 6, 2014. To expedite DEQ's review, MFA provided a draft of the revised text to DEQ on October 6, before production of the final document. DEQ responded in a letter on October 22 with their approval of the final document and implementation, subject to incorporation of their comments.

MFA provided a Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan dated November 7, 2014 which was a revision of previous versions and incorporated DEQ's September 18 and October 22 comments. The Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan was approved by DEQ in a December 10, 2014 e-mail.

BACKGROUND

The nested monitoring well pairs WS-14 and WS-11 are located near the north (plant northwest) corner of the Siltronic property, as shown in the attached figure. The wells were completed in October 2003 (WS-11) and July 2004 (WS-14). The monitoring well construction logs are included in Attachment A.

The monitoring well pair WS-11 is identified by OWRD as well log ID "MULT 72126" (i.e., Startcard No. 147655 and Well ID No. 67076). For monitoring well pair WS-14, the OWRD log "MULT 73686" reports the well number as WS-13, but the reported well number appears to be incorrect. The OWRD well log "MULT 73686" (i.e., Startcard No. 164731 and Well ID No. 73526) is the correct file for WS-14. The OWRD well logs are included in Attachment A.

FIELD ACTIVITIES

Public and private utility-locating services were used to check for underground utilities before well abandonment drilling activities began at WS-11 and WS-14. Additionally, an air knife was used around WS-11 and WS-14 to a depth of 10 feet below ground surface (bgs) to verify clearance from potential subsurface obstructions. The field work related to the decommissioning began on January 28, 2015 and ended on February 12, 2015.

On January 26, 2015, depth to water, depth to bottom, and depth to MGP waste DNAPL measurements were recorded (see the following table), and approximately 2 gallons of a MGP waste DNAPL/groundwater mixture was removed from WS-14-125, using a new, single-use bailer.

Well	DTW (feet below TOC)	DT-DNAPL (feet below TOC)	DTB (feet below TOC)
WS-11-125	24.55	T	124.65
WS-11-161	24.44	NP	160.80
WS-14-125	24.74	122.40 ^a	125.20
WS-14-161	24.68	158.75 to 158.80	158.90
NOTES: DT-DNAPL = depth to MGP waste DNAPL. DTB = depth to bottom. DTW = depth to water. NP = MGP waste DNAPL not detected using interface meter; no MGP waste DNAPL observed on interface meter. T = trace MGP waste DNAPL. TOC = top of casing. ^a Unable to obtain consistent measurement using interface meter. A new, single-use bailer showed approximately 2.8 feet of MGP waste DNAPL following deployment to the bottom of the well. DT-DNAPL obtained by subtracting 2.8 feet from DTB measurement.			

Cascade Drilling, L.P. of Clackamas, Oregon performed the monitoring well abandonment by overdrilling using a roto sonic drilling rig.

The monitoring well abandonments were conducted in accordance with applicable regulations, MFA's November 7, 2014 *Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan*, and an OWRD variance (i.e., special standard request approval) for each nested well pair. The approved special standard requests are included in Attachment B.

WS-11

A 10-inch diameter casing and 8-inch diameter core barrel were used to remove materials from ground surface to 130 feet bgs, approximately 5 feet below the bottom of the filter pack for WS-11-125. Subsequently, an 8-inch diameter casing and 6-inch diameter core barrel were used to remove materials from 130 feet bgs to 166 feet bgs, approximately 5 feet below the bottom of the filter pack for WS-11-161. No evidence of MGP waste DNAPL was observed in the material retrieved from below the bottom of the filter pack; therefore, drilling was terminated at 166 feet bgs, and bentonite/organoclay-bentonite borehole sealing proceeded. Gravel was used as surface completion to match the surrounding area.

The basis for the placement of the organoclay-bentonite grout was a combination of information from the WS-11 well installation log; boring logs for MW-36U, PW-2L/PW-2U, OW-2F, and GP-4; the TarGOST® log from nearby TG-PW2-130; and observations made during the overdrilling (abandonment) of WS-11. Observations that indicate the likely presence of MGP waste DNAPL (including hydrocarbon-like odors) were noted during the abandonment activities from 10 to 36 feet bgs and 106 to 146 feet bgs. Consistent with the video log observations, MGP waste DNAPL (i.e., staining) was only noted within the screened interval for WS-11-125. A 3-foot buffer of organoclay bentonite grout was placed on either side of the depths intervals where MGP waste DNAPL had the potential to occur.

The following table summarizes WS-11 borehole sealing material depths, volume/amount of material used, and mud-weight measurements.

WS-11 Borehole Sealing			
Depth (feet bgs)	Backfill Material	Amount	Mudweight (lbs/gallon)
0 to 3	Pea Gravel	35 50-lb bags	NA
3 to 7	Bentonite Chips	18 50-lb bags	NA
7 to 39	Organoclay-Bentonite Grout	315 gallons	9.7 to 9.9
39 to 103	Bentonite Grout	300 gallons	9.6 to 10.0
103 to 149	Organoclay-Bentonite Grout	495 gallons ^a	9.6 to 9.9
149 to 166	Bentonite Grout	46 gallons	10.0 to 10.1
NOTES: feet bgs = feet below ground surface. lbs = pounds. NA = not applicable. ^a The 10-inch diameter casing became stuck during the borehole sealing; this interval was regrouted after the 10-inch diameter casing was released; 495 gallons represents the total amount of grout used, including regrouting.			

WS-14

A 12-inch diameter casing was placed from 1 foot above ground surface to 19 feet bgs. A 10-inch diameter casing and 8-inch diameter core barrel were used to remove materials from ground surface to 130 feet bgs, approximately 5 feet below the bottom of the filter pack for WS-14-125. Subsequently, an 8-inch diameter casing and 7-inch diameter core barrel were used to remove materials from 130 feet bgs to 186 feet bgs, approximately 25 feet below the bottom of the filter pack for WS-14-161. There was no recovery of soil (which was observed in the field during abandonment activities to make a determination for the use of organoclay bentonite grout) from 130 to 173 feet bgs, so the core barrel was advanced to 186 feet bgs. No observations that indicate the likely presence of MGP waste DNAPL (including hydrocarbon-like odors) were observed between 173 and 186 feet bgs; therefore, drilling was terminated at 186 feet bgs, and bentonite/organoclay-bentonite borehole sealing proceeded. Gravel was used as surface completion to match the surrounding area.

The basis for the placement of the organoclay-bentonite grout was a combination of information from the WS-14 boring log from the monitoring well installation; boring logs for P-1, MW-35U, GP-99, PW-2L/PW-2U, OW-2F, and GP-4; the TarGOST® logs from nearby TG-12S and TG-PW2-130; and observations made during the overdrilling (abandonment) of WS-14. For WS-14, it was determined that the potential presence of MGP waste DNAPL (including hydrocarbon-like odors) may occur between 6 and 130 feet bgs. Consistent with the video log observations, MGP waste DNAPL (i.e., staining) was only noted within the screened intervals of WS-14-125 and WS-14-161. To account for the potential presence of MGP waste DNAPL in the interval of no recovery (from 130 to 173 feet bgs), organoclay-bentonite grout was used to seal this interval to 176 feet bgs. Similar to

WS-11, a 3-foot buffer of organoclay bentonite grout was placed on either side of the depths intervals where MGP waste DNAPL had the potential to occur. The following table summarizes WS-14 borehole sealing material depths, volume/amount of material used, and mud-weight measurements.

WS-14 Borehole Sealing			
Depth (feet bgs)	Backfill Material	Amount	Mudweight (lbs/gallon)
0 to 2	Pea Gravel	15 50-lb bags	NA
2 to 3	Bentonite Chips	8 50-lb bags	NA
3 to 176	Organoclay-Bentonite Grout	1012.5 gallons	9.7 to 9.9
176 to 186	Bentonite Grout	30 gallons	10.0
NOTES: feet bgs = feet below ground surface. lbs = pounds. NA = not applicable.			

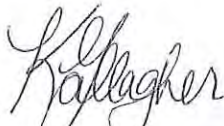
INVESTIGATION-DERIVED WASTE

Materials generated during the monitoring well abandonments were characterized and managed consistent with the procedures established for investigation-derived waste generated in the TCE Contaminated Material Management Area, as necessary. The waste characterization laboratory analytical reports are included in Attachment C and waste disposal manifests are included in Attachment D.

Please call or e-mail if you have any questions regarding this submittal.

Sincerely,

Maul Foster & Alongi, Inc.



Kerry-Cathlin Gallagher
Project Scientist



James G.D. Peale, RG
Principal Hydrogeologist

Attachments: Figure
A—Well Logs
B—Special Standards
C—Laboratory Analytical Reports
D—Waste Disposal Manifests

cc: Myron Burr, Siltronic Corporation
Ilene Gaekwad and William Earle, Davis Rothwell Earle & Xochihua, P.C.
Chris Reive, Jordan Ramis

FIGURE





Source: Aerial photograph obtained from Esri ArcGIS Online.

Note:
Locations are approximate
and shown for reference only.

 MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfooster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Legend






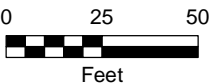
-  Geoprobe Location
-  NW Natural Well
-  Abandoned Siltronic Monitoring Well
-  TarGOST Boring
-  Siltronic Tax Lot

Figure
Monitoring Well WS-14
and WS-11 Locations

Siltronic Corporation
Portland, Oregon



ATTACHMENT A

WELL LOGS



Amended #2
3/20/15STATE OF OREGON
MONITORING WELL REPORT

(as required by ORS 537.765 & OAR 690-240-0395)

2/26/2015

WELL I.D. LABEL# L 67967

START CARD # 1025433

(1) LAND OWNER

Owner Well I.D. ~~WS-13~~ WS14

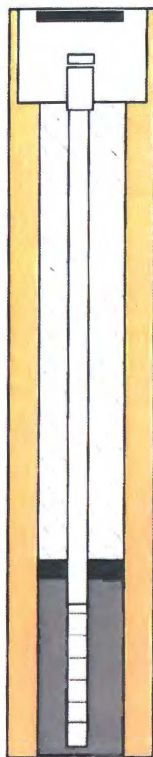
First Name _____ Last Name _____
 Company SILTRONIC CORPORATION
 Address 7200 NW FRONT AVE
 City PORTLAND State OR Zip 97210

(2) TYPE OF WORK ☐ New ☐ Deepening ☐ Conversion
☐ Alteration (repair/recondition) ☒ Abandonment

(3) DRILL METHOD

☐ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Hollow Stem Auger ☐ Cable Mud
☐ Reverse Rotary ☒ Other SONIC

(4) CONSTRUCTION

Piezometer Well ☐Depth of Completed Well 186.00 ft. Special Standard ☒

MONUMENT/VAULT

From _____ To _____

BORE HOLE

Diameter 10 12 From 0 To 130 19

CASING

Dia. _____ From ☐ To _____

Gauge _____ Wld Thrd _____

Material ☐ Steel ☐ Plastic ☐ ☐

LINER

Dia. _____ From ☐ To _____

Gauge _____ Wld Thrd _____

Material ☐ Steel ☐ Plastic ☐ ☐

SEAL

From _____ To _____

Material _____

Amount _____ Grout weight _____

SCREEN

Casing/Liner _____ Material _____

Diameter _____ From _____ To _____

Slot Size _____

FILTER

From _____ To _____ Material _____ Size of pack _____

(5) WELL TESTS

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
 Yield gal/min Drawdown Drill stem/Pump depth Duration (hr)

Temperature _____ °F Lab analysis ☐ Yes By _____

Supervising Geologist/Engineer _____

Water quality concerns? ☐ Yes (describe below)

From	To	Description	Amount	Units

(6) LOCATION OF WELL (legal description)

County MULTNOMAH Twp 1.00 N N/S Range 1.00 W E/W WM
 Sec 13 NW 1/4 of the NW 1/4 Tax Lot 1200
 Tax Map Number _____ Lot _____
 Lat _____ or _____ DMS or DD
 Long _____ or _____ DMS or DD
☒ Street address of well ☐ Nearest address

7200 NW FRONT AVE, PORTLAND OR

(7) STATIC WATER LEVEL

Date _____ SWL(psi) _____ + SWL(ft) _____
 Existing Well / Predeepening _____
 Completed Well _____

Flowing Artesian? ☐ Dry Hole? ☐
 WATER BEARING ZONES Depth water was first found _____

SWL Date	From	To	Est Flow	SWL(psi)	+ SWL(ft)

(8) WELL LOG

Ground Elevation _____

Pea gravel Material 0 From 2 To 3
 Chips 0 2 3
 Organo Clay 3 4 176
 Aqua Guard 176 186

RECEIVED BY OWRD

APR 01 2015

SALEM, OR

Date Started 2/13/2015 2/5/2015 Completed 2/13/2015 2/12/2015

(unbonded) Monitor Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon monitoring well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number 10329 Date 2/26/2015

Password : (if filing electronically)

Signed RODNEY LABROSSE SR (E-filed)

(bonded) Monitor Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon monitoring well construction standards. This report is true to the best of my knowledge and belief.

License Number 10306 Date 2/26/2015

Password : (if filing electronically)

Signed J TRENT CASTNER (E-filed)Contact Info (optional) Cascade Drilling

ORIGINAL - WATER RESOURCES DEPARTMENT

THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK

Form Version:

MONITORING WELL REPORT - Map with location identified must be attached and shall include an approximate scale and north arrow

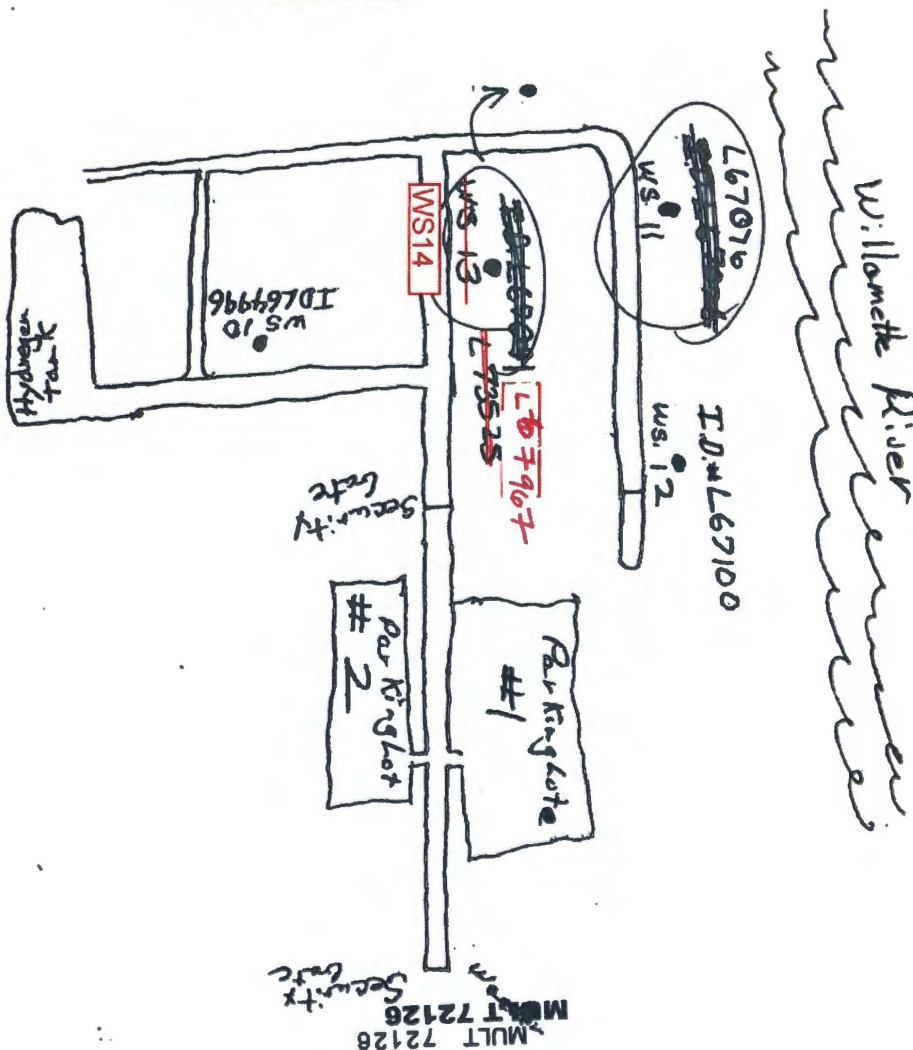
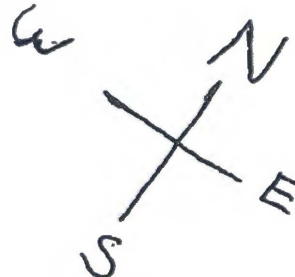
2/26/2015

Map of Hole

RECEIVED BY OWRD
APR 01 2015
SALEM, OR

RECEIVED
DEC 10 2003
WATER RESOURCES DEPT
SALEM, OREGON

1001



STATE OF OREGON

MONITORING WELL REPORT

(as required by ORS 537.765 & OAR 690-240-0395)

2/26/2015

WELL I.D. LABEL# L 67076

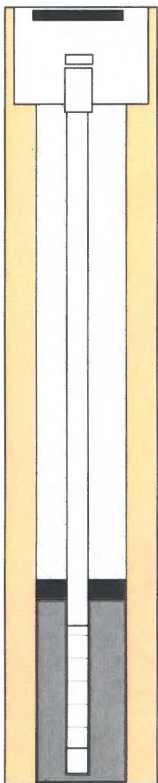
START CARD # 1025432

(1) LAND OWNER		Owner Well I.D. <u>WS11</u>
First Name _____	Last Name _____	
Company <u>SILTRONIC CORPORATION</u>		
Address <u>7200 NW FRONT AVE</u>		
City <u>PORTLAND</u>	State <u>OR</u>	Zip <u>97210</u>

(2) TYPE OF WORK ☐ New ☐ Deepening ☐ Conversion
☐ Alteration (repair/recondition) ☒ Abandonment

(3) DRILL METHOD
☐ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Hollow Stem Auger ☐ Cable Mud
☐ Reverse Rotary ☒ Other SONIC

(4) CONSTRUCTION Piezometer Well ☐
 Depth of Completed Well 166.00 ft. Special Standard ☒



MONUMENT/VAULT _____
From To

BORE HOLE
Diameter 10 From 0 To 130

CASING

Dia. _____ From ☐ _____ To _____

Gauge _____ Wld Thrd _____

Material ☐ Steel ☐ Plastic ☐ ☐

LINER

Dia. _____ From ☐ _____ To _____

Gauge _____ Wld Thrd _____

Material ☐ Steel ☐ Plastic ☐ ☐

SEAL

From _____ To _____

Material _____

Amount _____ Grout weight _____

SCREEN _____

Casing/Liner _____ Material _____

Diameter _____ From _____ To _____

Slot Size _____

		FILTER	
From	To	Material	Size of pack

(5) WELL TESTS

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
 Yield gal/min Drawdown Drill stem/Pump depth Duration (hr)

Temperature °F Lab analysis ☐ Yes By

Supervising Geologist/Engineer _____

Water quality concerns? ☐ Yes (describe below)

From	To	Description	Amount	Units

(6) LOCATION OF WELL (legal description)

County	MULTNOMAH	Twp	1.00	N	N/S	Range	1.00	W	E/W	WM
Sec	13	SW	1/4 of the	SW	1/4	Tax Lot	1200	.		
Tax Map Number						Lot				
Lat	°	'	"	or		DMS or DD				
Long	°	'	"	or		DMS or DD				

☐ Street address of well ☐ Nearest address

7200 NW FRONT AVE, PORTLAND OR

(7) STATIC WATER LEVEL

	Date	SWL(psi)	+ SWL(ft)
Existing Well / Predeepening			
Completed Well			

Flowing Artesian? ☐ Dry Hole? ☐
WATER BEARING ZONES Depth water was first found

SWL Date	From	To	Est Flow	SWL(,psi)	+ SWL(ft)

(8) WELL LOG

[illegible]

Date Started ~~2/13/2015~~ **1/28/2015** completed ~~2/13/2015~~ **2/4/2015**

(unbonded) Monitor Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon monitoring well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number 10329 Date 2/26/2015

Password : (if filing electronically)

Signed RODNEY LABROSSE SR (E-filed)

(bonded) Monitor Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon monitoring well construction standards. This report is true to the best of my knowledge and belief.

License Number 10306 Date 2/26/2015

 Password : (if filing electronically)

Signed J TRENT CASTNER (E-filed)

Contact Info (optional) Cascade Drilling

START CARD # 1025432

Water Bearing Zones

SEAL sacks/ grout

(8) WELL LOG

SCREENS

(5) WELL TESTS

Water Quality Concerns

From	To	Description	Amount	Units

Comments/Remarks

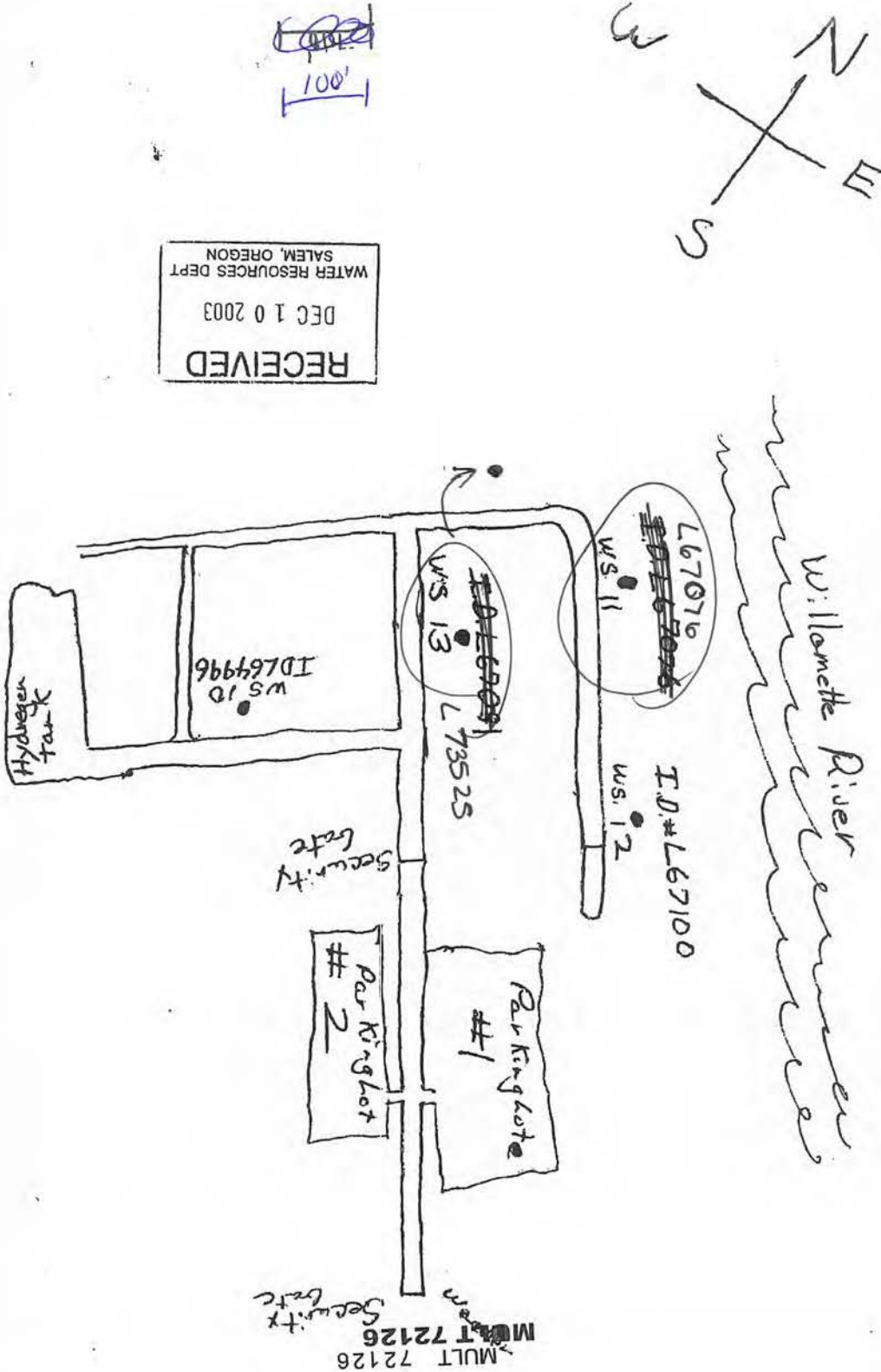
Over Drilled nested well, Special Standard - used Organo Clay in Sealing hole.

MONITORING WELL REPORT - Map with location identified must be attached and shall include an approximate scale and north arrow

MULT 118592

2/26/2015

Map of Hole



STATE OF OREGON
MONITORING WELL REPORT
(as required by ORS 537.765 & OAR 690-240-095)

MULT 72125
MULT 72125

Page 1 of 2

WV 67091
Start Card # W158756

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT:

WELL NO. U.S 13

Name Wacker

Address 7200 N.W. Front Ave

City Portland

State OR

(2) TYPE OF WORK:

- ☒ New construction ☐ Alteration ☐ Deepening ☐ Abandonment
☐ Conversion ☐ Deepening ☐ Abandonment

(3) DRILLING METHOD

- ☐ Rotary Air ☐ Rotary Mud ☐ Cable
☐ Hollow Stem Auger ☒ Other 96" e

(6) LOCATION OF WELL By legal description

Well Location: County Multnomah

Township 1N (N or S) Range 1W (E or W) Section 13

1. SW 1/4 of SW 1/4 of above section.

2. Either Street address of well location 7200 N.W. Front Ave Portland Or

or Tax lot number of well location 1200

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL:

29.3 Ft. below land surface.

Date 10-20-03

Artesian Pressure _____ lb/sq. in. Date _____

BORE HOLE CONSTRUCTION

Special Standards ☒ Yes ☐ No

Depth of completed well 105 ft.

WATER RESOURCES DEPT.
SALEM, OREGON

WATER BEARING ZONES:

Depth at which water was first found _____

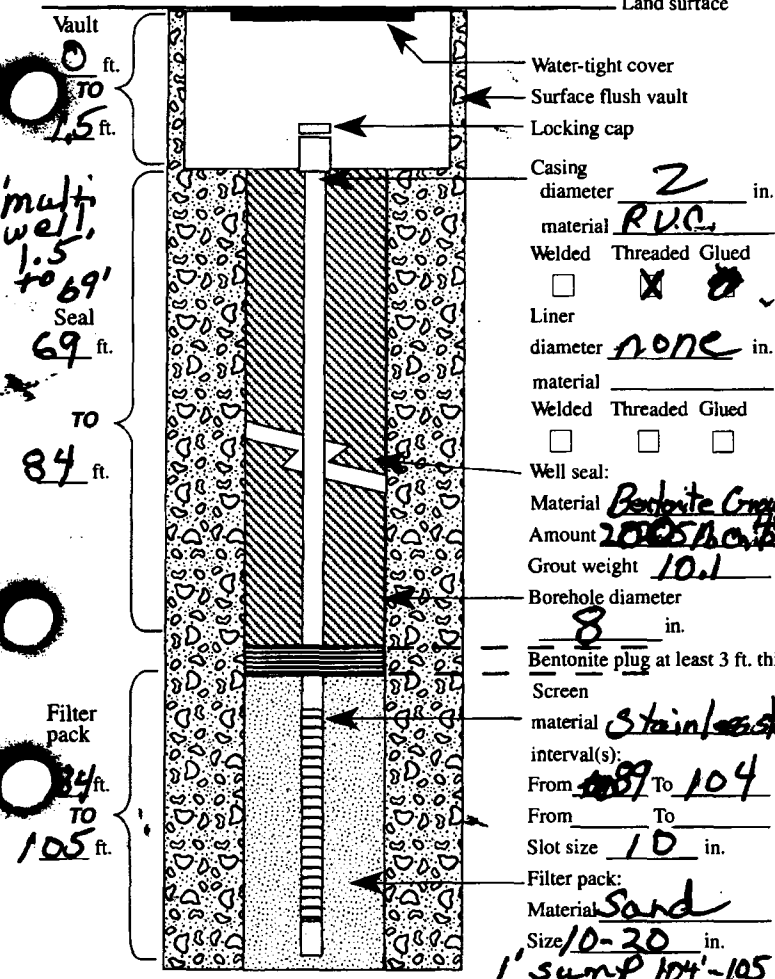
From	To	Est. Flow Rate	SWL
<u>84</u>	<u>105</u>	<u>1.5</u>	<u>29.3</u>
<u>177</u>	<u>207</u>	<u>2.0</u>	<u>U.K.</u>

(9) WELL LOG:

Ground elevation U.K.

Material	From	To	SWL
<u>Fill</u>	<u>0</u>	<u>2</u>	
<u>Silty Clay</u>	<u>2</u>	<u>58</u>	
<u>Silty sand with</u>	<u>58</u>		
<u>layers of sand</u>		<u>177</u>	
<u>Basalt weathered</u>	<u>177</u>	<u>203</u>	
<u>Basalt Crap</u>	<u>203</u>	<u>207</u>	
<u>Well was back filled thow</u>			
<u>trimmings pipe from 207 to 165</u>			
<u>with Coated pentonite pellets</u>			
<u>From 165' to 117' with 10.0</u>			
<u>lb. Grout</u>			
<u>From 117' to 105' with Coated</u>			
<u>Pellets</u>			

Date started 10-3-03 Completed 10-21-03



(5) WELL TEST:

☒ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
Permeability U.K. Yield 1.5 GPM
Conductivity 544 US/cm PH 6.30
Temperature of water 14.74 °F Depth artesian flow found none ft.
Was water analysis done? ☐ Yes ☒ No
By whom? _____
Depth of strata to be analyzed. From _____ ft. to _____ ft.
Remarks: _____

Name of supervising Geologist/Engineer _____

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

Signed David Donly MWC Number 10192
Date 10-21-03

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

Signed [Signature] MWC Number 104372
Date 2-11-05
SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT:

WELL NO. W.S. 13

Name Wacker

Address 2200 N.W. Front Ave

City Portland State Or Zip 97210

(2) TYPE OF WORK:

- ☒ New construction ☐ Alteration (Repair/Recondition)
☐ Conversion ☐ Deepening ☐ Abandonment

(3) DRILLING METHOD

- ☐ Rotary Air ☐ Rotary Mud ☐ Cable
☐ Hollow Stem Auger ☒ Other Some

(6) LOCATION OF WELL By legal description

Well Location: County Multnomah

Township 1N (N or S) Range 1W (E or W) Section 13

1. SW 1/4 of SW 1/4 of above section.

2. Either Street address of well location 2200 N.W. Front Ave Portland Or
or Tax lot number of well location 1200

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL:

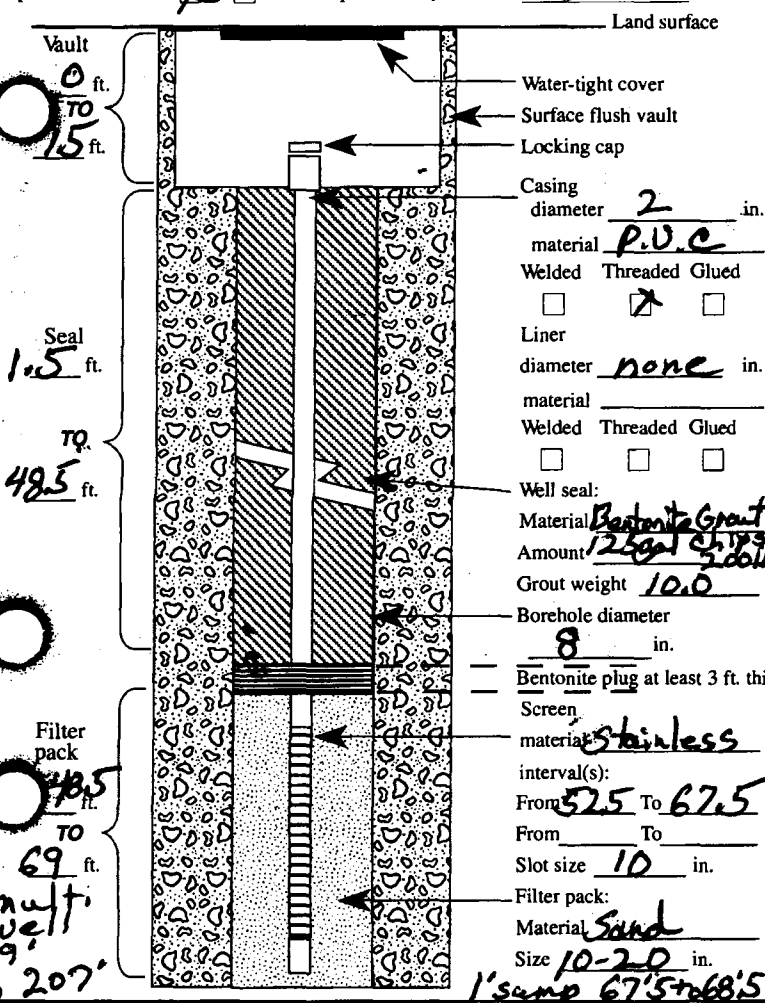
27.18 Ft. below land surface.

Date 10-21-03

Artesian Pressure lb/sq. in. Date

BORE HOLE CONSTRUCTION

Special Standards Yes ☒ No ☐ Depth of completed well 69' ft.



(8) WATER BEARING ZONES:

Depth at which water was first found

From	To	Est. Flow Rate	SWL
84	105	1.5	29.3
177	207	2.0	U.K.

(9) WELL LOG:

Ground elevation

Material	From	To	SWL
Fill	0	2	
Silty Clay	2	58	
Silty Sand with	58	177	
Layers of Sand			
Basalt Weatherside	177	203	
Basalt Gray	203	207	

Date started 10-3-03 Completed 10-21-03

(5) WELL TEST:

☒ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
Permeability Yield 0.05 GPM
Conductivity 672 PH 8.28
Temperature of water 17.82 °F/C Depth artesian flow found ft.
Was water analysis done? ☐ Yes ☒ No
By whom?
Depth of strata to be analyzed. From ft. to ft.
Remarks:

Name of supervising Geologist/Engineer

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

Signed David Donnelly MWC Number 10192
Date 10-21-03

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

Signed MWC Number 10437
Date 2-11-05
SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

Willamette River

I.D. L67076 I.D. #L67100

WS 11 WS 12

Parking lot #1

Parking lot #2

Security Gate

Security Gate

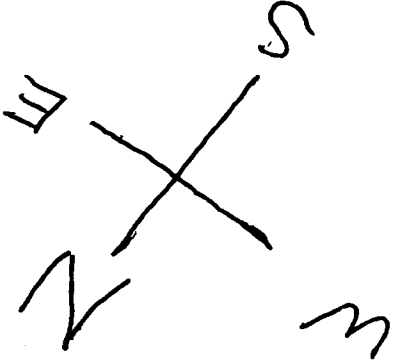
I.D. L67091 WS 13

WS 10 ID L64996

Hydrogen tank

RECEIVED
DEC 10 2003
WATER RESOURCES DEPT
SALEM, OREGON

RECEIVED
MAY 05 2005
WATER RESOURCES DEPT
SALEM, OREGON



STATE OF OREGON
MONITORING WELL REPORT
(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT: WELL NO. W.S. 11
Name Wacker S. Ironic Corp
Address 2200 N.W. Front Ave
City Portland State Or Zip 97210

(2) TYPE OF WORK:
☒ New construction ☐ Alteration (Repair/Recondition)
☐ Conversion ☐ Deepening ☐ Abandonment

(3) DRILLING METHOD

☐ Rotary Air ☐ Rotary Mud ☐ Cable
☐ Hollow Stem Auger ☒ Other Senic

(6) LOCATION OF WELL By legal description

Well Location: County Multnomah
Township 1N (N or S) Range 1W (E or W) Section 13
1. SW 1/4 of SW 1/4 of above section.
2. Either Street address of well location 7200 NW
Front Ave Portland Or.
or Tax lot number of well location 1200

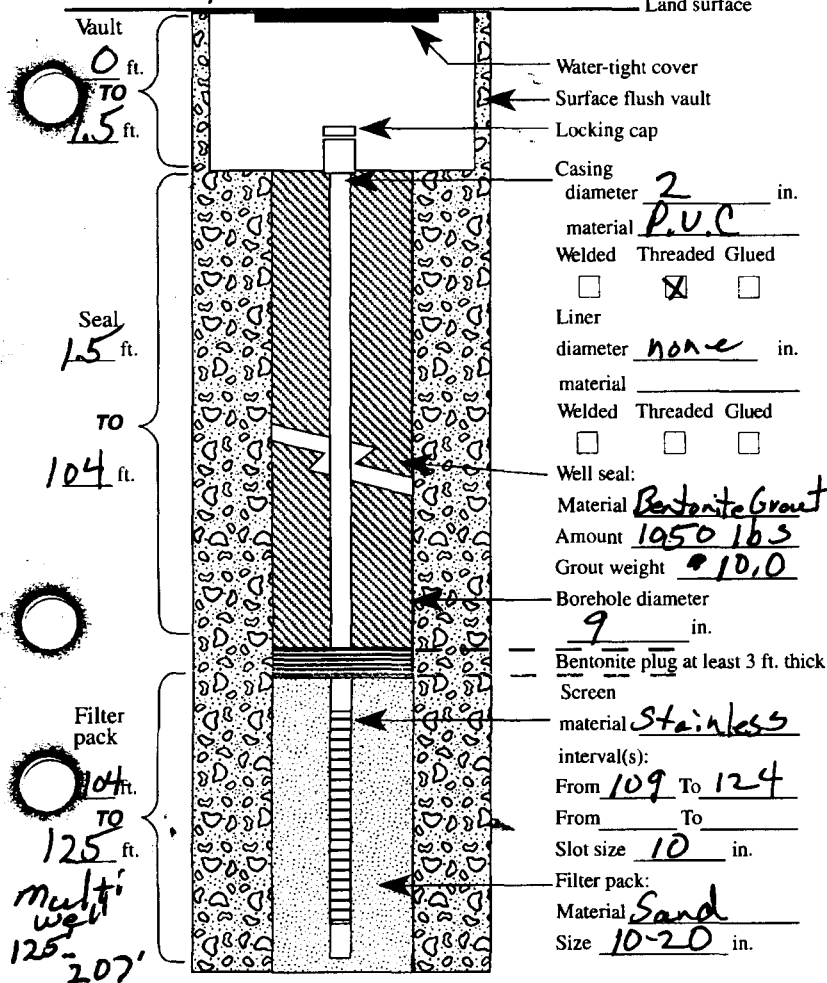
3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL:

22.4 Ft. below land surface. Date 10-20-03
Artesian Pressure _____ lb/sq. in. Date _____

BORE HOLE CONSTRUCTION

Special Standards ☒ Yes ☐ No
Depth of completed well 125 ft.



(8) WATER BEARING ZONES:

From	To	Est. Flow Rate	SWL
109	124	1.0	22.4
RECEIVED			
JUL 06 2004			

(9) WELL LOG:

Ground elevation WATER RESOURCES DEPT
SALEM, OREGON

Material	From	To	SWL
Topsoil	0	1	
Sand Light Brown	1	30	
Silt with layers of	30		
Sand		52	
Sand Black with	52		
Layer of silt		187	
Silty Gravel	187	203	
Basalt	203	207	
RECEIVED			
DEC 10 2003			
WATER RESOURCES DEPT			
SALEM, OREGON			

Date started 9-21-03 Completed 10-21-03

(5) WELL TEST:

☒ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
Permeability _____ Yield 1.0 GPM
Conductivity 576 uS/cm PH 6.43
Temperature of water 16.03 °F/C Depth artesian flow found _____ ft.
Was water analysis done? ☐ Yes ☒ No
By whom? _____
Depth of strata to be analyzed. From _____ ft. to _____ ft.
Remarks: _____

Name of supervising Geologist/Engineer Mark Easter & Alongi
ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

Signed Donoff MWC Number 10192
Date _____

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

Signed Mark Easter & Alongi MWC Number 10540
Date 7/2/04
SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

MULT 72126
MULT 72126

Security Gate

Willamette River

I.D. L67076 I.D. #L67100

WS 11 WS 12

Parking lot #1

Parking lot #2

Security Gate

I.D. L67091
WS 13

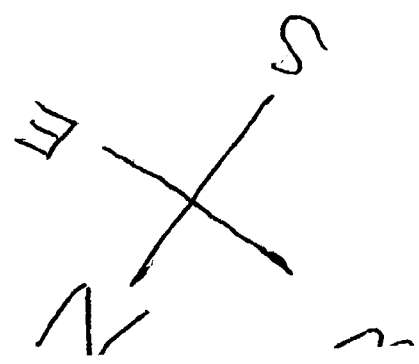
WS 10
ID L64996

Hydrogen tank

RECEIVED

DEC 10 2003

WATER RESOURCES DEPT
SALEM, OREGON



MULT 72126



Oregon

Theodore R. Kulongoski, Governor

Water Resources Department

Commerce Building
158 12th Street NE
Salem, OR 97301-4172
503-378-3739
FAX 503-378-8130

September 2, 2003

MARK KNOLLE #10437
C/O PROSONIC CORP
305 E. COMSTOCK DR
CHANDLER AZ 85225

FINAL ORDER

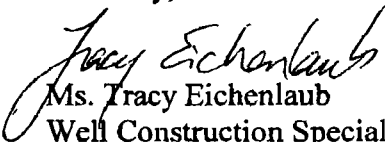
Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card numbers 147653-147655 is approved for the following: multiple completion wells, the wells will have two (2) 2 inch wells in each borehole. See Oregon Administrative Rule (OAR) 690-240-0410(5). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 378-8455 ext 283, or by e-mail at tracy.l.eichenlaub@wrdd.state.or.us.

Sincerely,



Ms. Tracy Eichenlaub
Well Construction Specialist
Enforcement Section

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137.004-0080 and OAR 690-01-0005 you may either petition for judicial review or petition the Director for reconsideration of this order.

MULT 72126

**Oregon**

Theodore R. Kulongoski, Governor

Water Resources Department

Commerce Building
158 12th Street NE
Salem, OR 97301-4172
503-378-3739
FAX 503-378-8130

October 6, 2003

MARK KNOLLE #10437
C/O PROSONIC CORP
305 E. COMSTOCK DR
CHANDLER AZ 85225

FINAL ORDER

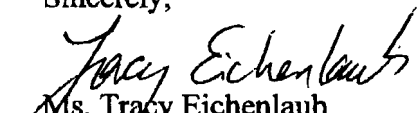
Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card number 147655 is approved for the following: use of bentonite below 50 feet and through more than 25 feet of water, 3/8 inch bentonite pellets will be used to abandon the bottom of the hole from 206 feet to 160 feet. See Oregon Administrative Rule (OAR) 690-240-0475(3). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 986-0851, or by e-mail at tracy.l.eichenlaub@wrdd.state.or.us.

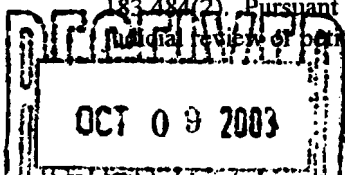
Sincerely,


Ms. Tracy Eichenlaub
Well Construction Specialist
Enforcement Section






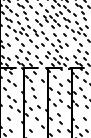
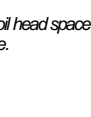
enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

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GBLWC W:\GINTGINTWPROJECTS\8128-01\WS10-13.GPJ 7/2/04

Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction								
		Project Number 8128.01.06		Well Number WS-11		Sheet 1 of 11				
Project Name Project Location Start/End Date Driller/Equipment Geologist/Engineer Sample Method		Wacker Siltronic Corporation 7200 Northwest Front Avenue, Portland Oregon 97210 9/21/03 to 10/3/03 Prosonic Corporation/Rotosonic Tony Silva 4x6 Core Barrel				TOC Elevation (feet NGVD) Surface Elevation (feet NGVD) Northing Easting Hole Depth Outer Hole Diam				31.8500 31.9350 7624628.3 705147.0 207.0-feet 9.0/6.0-inch
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description	
1			100%	CB		PID = 0.0			0.0 to 0.5 feet: TOPSOIL, GRAVELLY SILT (ML); grayish brown; 20% fines, non plastic; 30% gravel, medium, subangular; 50% organic debris, rootlets, woody debris; moist. 0.5 to 1.5 feet: SANDY GRAVEL (GP); brownish-gray; 40% sand, fine to medium; 60% gravel, fine, subangular to subrounded; dry. (Fill) 1.5 to 7.0 feet: SAND (SP); light brown; 95% sand, medium; 5% gravels, fine to medium, subrounded; moist. (Fill)	
2						PID = 0.0				
3						PID = 0.0				
4			100%	CB		PID = 0.0				
5						PID = 0.0				
6						PID = 0.0				
7			100%	CB		PID = 0.0			7.0 to 12.0 feet: SAND (SP); dark brown; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)	
8						PID = 0.0				
9						PID = 0.0				
10						PID = 0.0				
11						PID = 0.0				
12						PID = 0.0				
13						PID = 0.0			12.0 to 16.0 feet: WOOD; core of wood; staining at upper end of wood; naphthalene or petroleum like odor. (Fill)	
14						PID = 0.0				
15						PID = 0.0				
16			100%	CB		PID = 0.0			16.0 to 17.0 feet: SAND (SP); dark brown; 100% sand, fine to medium; trace fines and gravels; moist. Possibly drilling sluff from trying to clean out the hole from the wood. (Fill) 17.0 to 18.0 feet: WOOD; core of wood; staining at upper end of wood; naphthalene or petroleum like odor. (Fill)	
17						PID = 0.0				
18			100%	CB		PID = 0.0				
19						PID = 0.0			18.0 to 19.0 feet: SAND (SP); light brown, moist; 100% sand, fine to medium; trace fines and gravels; moist. (Fill) 19.0 to 21.0 feet: SANDY SILT (ML-SM); light gray; 50% fines, non plastic; 50% sand, fine to medium; dry. Brittle, breaks apart in flakes. (Fill)	
20						PID = 0.0				

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

Geologic Borehole Log/Well Construction

Sheet
2 of 11

Depth (feet, BGS)	Well Details			Sample Data				Lithologic Column	Soil Description
				Interval	Percent Recovery	Collection Method	Number		
21									21.0 to 27.0 feet: SAND (SP); reddish-brown; 90% sand, fine to medium; 10% gravel, fine to medium, subrounded; dry to moist. (Fill) @ 22.5 feet: 0.2-foot layer color change to light gray. Steel debris, possibly steel shackle from a padlock.
22									
23									
24									
25									
26									
27				90%	CB				27.0 to 28.0 feet: NO RECOVERY.
28									
29									28.0 to 31.5 feet: SAND (SP); dark gray; 95% sand, fine to medium; 5% gravels, subrounded; wet. (Fill)
30									
31									
32									31.5 to 37.0 feet: SILTY SAND to SANDY SILT (SM-ML); dark gray; 50% fines, non plastic; 50% sand, fine; organic debris, roots; moist to wet.
33									@ 31.5 feet: 0.2-foot thick layer of staining, sheen. Petroleum like odor.
34									
35									
36									
37				90%	CB				37.0 to 38.0 feet: NO RECOVERY.
38									
39									38.0 to 41.0 feet: SANDY SILT (ML); dark gray; 60% fines, non plastic; 40% sand, fine; organic debris, wood, roots; wet.
40									
41									
42									41.0 to 47.0 feet: SILTY SAND (SM); dark gray; 25% fines, non plastic; 75% sand, fine to medium; organic debris, roots, woody debris; wet. Faint petroleum-like odor.

NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.

Approximate water level observed prior to well development.

GBLWC W:\GINT\PROJECTS\8128-01\WS10-13.GPJ 7/2/04


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Maul Foster & Alongi, Inc.				Geologic Borehole Log/Well Construction								
				Project Number 8128.01.06			Well Number WS-11			Sheet 3 of 11		
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Soil Description				
					Number	Name (Type)	Blows/6"	Lithologic Column				
43												
44												
45						PID = 0.0						
46												
47			100%	CB		PID = 0.0			47.0 to 50.0 feet: SILTY SAND (SM); dark gray; 40% fines, non plastic; 60% sand, fine to medium; micaceous; organic debris; wet.			
48												
49												
50						PID = 0.0			50.0 to 53.5 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet.			
51												
52						PID = 0.0						
53												
54						PID = 0.0			53.5 to 54.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine; sand in pockets; micaceous; organic debris.			
55									54.0 to 57.0 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet.			
56												
57			100%	CB		PID = 0.0			57.0 to 58.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous; organic debris; wet.			
58												
59						PID = 0.0			58.0 to 59.0 feet: SILT (ML); dark gray; 100% fines, medium plasticity, trace fine sand in pockets; micaceous; organic debris, roots; wet.			
60									59.0 to 60.0 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet.			
61						PID = 0.0			60.0 to 64.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium, micaceous; organic debris; wet.			
62			100%	CB		PID = 0.0						
63						PID = 0.0						
64												
65									64.0 to 67.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium; micaceous, coarse mica flakes; wet.			

NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC=poly vinyl chloride.

Approximate water level observed prior to well development.


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Approximate water level observed prior to well development.

GBLWC W:\GINTGINTWPROJECTS\8128-01\WS10-13.GPJ 7/2/04

Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction						
		Project Number 8128.01.06			Well Number WS-11		Sheet 5 of 11	
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Soil Description
					Number	Name (Type)	Blows/6"	
88						PID = 0.0		fine; micaceous; wet.
89						PID = 0.0		87.5 to 88.0 feet: SILT with SAND (ML); dark gray; 70% fines, non plastic; 30% sand, fine to medium; micaceous; organic debris; moist to wet.
90								88.0 to 92.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; wet.
91								
92								
93								92.5 to 94.5 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine to medium, sand in pockets; micaceous; organic debris; wet.
94								
95						PID = 1.5		94.5 to 98.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; wet.
96								
97						PID = 1.5		
98								98.0 to 102.0 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet. Fines occur in nodules, up to 0.5-inches in diameter.
99								
100								
101				GW	WS11-W-102.0	PID = 4.5		
102			100%	CB		PID = 13.6		102.0 to 107.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
103						PID = 0.0		
104								
105						PID = 0.0		@ 105.0 feet: 0.2-foot layer of SILT (ML); dark gray; 90% fines, 10% sand, fine, sand in pockets; wet.
106								@ 105.5 feet: 0.2-foot layer of SILT (ML); dark gray; 90% fines, 10% sand, fine, sand in pockets; wet.
107			90%	CB		PID = 0.0		107.0 to 108.0 feet: NO RECOVERY.
108						PID = 3.0		108.0 to 112.0 feet: SILT (ML); dark gray to greenish-gray; 100% fines, low to medium plasticity; micaceous; organic debris, roots, leaves; wet.
109								Visible sheen on water in soil core bag.
110								

NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.


Approximate water level observed prior to well development.


GBLWC W:\GINTGINT\PROJECTS\8128-01\WS10-13.GPJ 7/2/04

Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction						
		Project Number 8128.01.06		Well Number WS-11		Sheet 6 of 11		
Depth (feet, BGS)	Well Details	Sample Data						Soil Description
		Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	
111						PID = 3.1		
112								
113						PID = 0.0		112.0 to 118.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
114								
115								
116				GW		WS11-W-117.0 WS11-W-DUP PID = 3.1		@ 116.0 feet: 0.1-foot layer of SILT (ML).
117								
118			100%	CB		PID = 3.1		
119						PID = 6.2		118.0 to 118.5 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; wet. Strong odor, visible sheen on soil.
120								118.5 to 119.5 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium; wet. Faint odor.
121						PID = 0.0		119.5 to 119.7 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
122								119.7 to 120.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium; micaceous; wet.
123								120.0 to 122.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
124						PID = 0.0		122.0 to 123.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium; micaceous; wet.
125								123.0 to 127.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
126						PID = 0.0		
127								
128			100%	CB		PID = 0.0		127.0 to 128.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium, red and green lithics; wet.
129								128.0 to 132.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
130								
131				GW		WS11-W-132.0 PID = 0.0		@ 130.0 feet: 0.3-foot layer of SILT (ML); dark gray; organic debris.
132								
			100%	CB		PID = 0.0		132.0 to 137.0 feet: SAND (SP); dark gray with white speckles, salt and

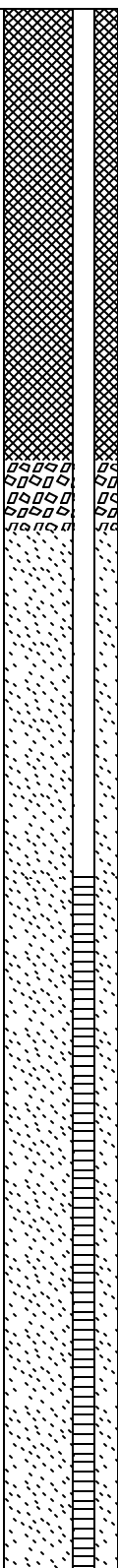
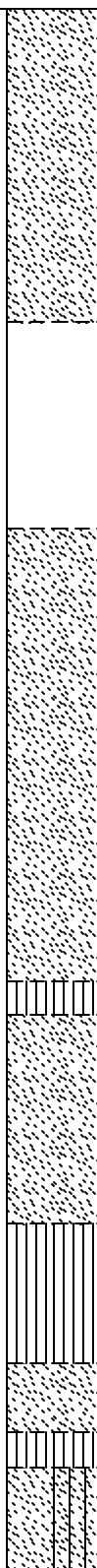
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Approximate water level observed prior to well development.

NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.


Approximate water level observed prior to well development.


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Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction							
		Project Number 8128.01.06		Well Number WS-11		Sheet 7 of 11			
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
133		70%	CB			PID = 0.0		pepper look; 5% fines, non plastic; 95% sand, medium; micaceous; wet.	
134						PID = 0.0			
135						PID = 0.0			
136						PID = 0.0			
137						PID = 0.0			
138						137.0 to 140.0 feet: NO RECOVERY.			
139									
140						PID = 0.0			
141						140.0 to 146.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, dark green and red lithics; micaceous; wet.			
142									
143						PID = 0.0			
144									
145						WS11-W-147.0 PID = 0.0			
146									
147						146.5 to 147.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium, sand in pockets; micaceous; wet.			
148						147.0 to 150.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, medium, dark green and red lithics; micaceous; wet.			
149						PID = 0.0			
150						150.0 to 152.0 feet: SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium, sand in pockets; micaceous; organic debris; wet.			
151									
152						152.0 to 153.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, medium, dark green and red lithics; micaceous; wet.			
153						153.0 to 153.5 feet: SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium, sand in pockets; micaceous; organic debris; wet.			
154						153.5 to 157 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium, red and green lithics; organic debris; wet. Fines occur in chunks or balls.			
155									

NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.

Approximate water level observed prior to well development.

NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.

 **Approximate water level observed prior to well development.**


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Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction							
		Project Number 8128.01.06		Well Number WS-11		Sheet 8 of 11			
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
156							PID = 0.0		
157			100%	CB			PID = 0.0		@ 157.0 feet: 0.2-foot layer of SILT (ML). 157.2 to 160.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
158							PID = 0.0		
159							PID = 0.0		160.0 to 161.0 feet: SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium; wet.
160							PID = 0.0		161.0 to 164.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
161							PID = 0.0		@162.0 feet: 0.3-foot layer of SILT (ML).
162							PID = 0.0		@162.8 feet: 0.3-foot layer of SILT (ML).
163							PID = 0.0		164.0 to 165.0 feet: SILT (ML); dark gray to greenish-gray; 90% fines, low to medium plasticity; 10% sand, fine, sand in pockets; organic debris; wet.
164							PID = 0.0		165.0 to 165.5 feet: SANDY SILT (ML); dark gray to greenish gray; 60% fines, non plastic; 40% sand, fine; wet.
165				GW	WS11-W-167.0		PID = 0.0		165.5 to 167.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
166							PID = 0.0		167.0 to 169.0 feet: NO RECOVERY.
167			80%	CB			PID = 0.0		169.0 to 170.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine, green and red lithics; wet.
168							PID = 0.0		170.5 to 171 feet: SILTY SAND (SM); dark gray; 20% fines, low plasticity; 80% sand, fine; wet.
169							PID = 0.0		171.0 to 174.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, dark green and red lithics; wet.
170							PID = 0.0		
171							PID = 0.0		174.0 to 174.5 feet: SILT (ML); dark gray to greenish-gray; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; wet.
172							PID = 0.0		174.5 to 179.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium, green and red lithics; wet.
173							PID = 0.0		
174							PID = 0.0		
175							PID = 0.0		
176							PID = 0.0		
177			100%	CB			PID = 0.0		

NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.

Approximate water level observed prior to well development.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.


Approximate water level observed prior to well development.

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Maul Foster & Alongi, Inc.				Geologic Borehole Log/Well Construction					
				Project Number 8128.01.06		Well Number WS-11		Sheet 10 of 11	
Depth (feet, BGS)	Well Details	Interval Percent Recovery	Collection Method	Sample Data			Blows/6"	Lithologic Column	Soil Description
				Number	Name (Type)				
201			GW		PID = 0.0			201.0 to 204.5 feet: SILTY GRAVEL (GM); dark gray; 15% fines, non plastic; 85% gravel, fine to coarse, subrounded to rounded; wet. 204.5 to 207.0 feet: BASALT; light gray to dark gray; moist to wet; bedrock. (Columbia River Basalt Group) Significant increase in resistance, drilling hardness.	
202					PID = 0.0				
203									
204					WS11-206.0				
205									
206									
207									
Total Depth = 207.0 feet below ground surface.									
<div style="text-align: right;"> WS11 Completion Details Oregon Water Resources Department Well Start Card Number: W147655 Oregon Water Resources Department Well Identification Number: L67076 <u>Boring:</u> 0.0 to 58.0 feet bgs: 9-inch temporary, threaded steel, isolation casing. 0.0 to 137.0 feet bgs: 8-inch temporary, threaded steel, isolation casing. 0.0 to 58.0 feet bgs: 7-inch temporary, threaded steel, isolation casing. 0.0 to 207.0 feet bgs: 6-inch temporary, threaded steel, isolation casing. 0.0 to 207.0 feet bgs: 4x6-inch core barrel sampler. 0.0 to 1.5 feet bgs: flush mount vault and cement seal. 1.5 to 5.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water. 5.0 to 102.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon. 102.0 to 104.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water. 104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack. 106.0 to 124.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack. 124.0 to 126.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water. 126.0 to 139.0 feet bgs: bentonite grout slurry, 10.3 pounds per gallon. 139.0 to 140.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water. 140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack. 142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack. 161.0 to 207.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water. <u>Well WS11-125:</u> 0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe. 109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot. 124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump. </div>									
NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.									
<div style="display: flex; align-items: center;"> <div> Approximate water level observed prior to well development. </div> </div>									

Maul Foster & Alongi, Inc.					Geologic Borehole Log/Well Construction						
					Project Number 8128.01.06			Well Number WS-11		Sheet 11 of 11	
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description		
					Number	Name (Type)	Blows/6"				
<div><div>Well WS11-161:</div><div>0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.</div><div>145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.</div><div>160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.</div></div>											
<div>NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.</div> <div><div><div></div></div><div>Approximate water level observed prior to well development.</div></div>											

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
1 of 11

Project Name **Siltronic Corporation**
Project Location **7200 NW Front Avenue Portland, Oregon**
Start/End Date **6/22/2004 to 7/9/2004**
Driller/Equipment **Boart Longyear/Rotosonic**
Geologist/Engineer **ABC/EB**
Sample Method **4x6-inch core barrel.**

TOC Elevation (feet)
Surface Elevation (feet) **32.4**
Northing **705183.4**
Easting **7624486.1**
Hole Depth **210.0-feet**
Outer Hole Diam **10.0 to 6.0-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)				
1			100	CB						0.0 to 1.3 feet: GRAVELLY SILT (ML); dark yellowish-brown; 70% fines, non plastic; 30% gravels, fine, subangular; trace organic debris; dry.
2						PID = 0ppm.				1.3 to 10.0 feet: SILTY SAND (SM); dark gray; 40-50% fines, low plasticity; 50-60% sand, fine; damp.
3										
4			80%	CB						@ 5.0-feet: Increased fines to 50%.
5						PID = 0ppm.				
6			95%	CB						
7										
8						PID = 0ppm.				@ 9.5-feet: slight odor.
9										
10										10.0 to 11.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; no noticeable odor; damp.
11			100	CB						11.0 to 14.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; trace gravels, fine to coarse; trace organic debris; slight odor; tarr-like balls; damp.
12										
13						PID = 0ppm.				
14										14.0 to 16.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; trace organic debris; no noticeable odor; damp.
15										
16			100	CB		PID = 0ppm.				16.0 to 18.5 feet: GRAVELLY SAND (SP); light grayish-brown; 70% sand, fine; 30% gravels, fine to medium, subangular; trace fines; damp.
17										
18										
19						PID = 0ppm.				18.5 to 22.0 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.
20										

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

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2 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
21			100	CB		PID = 0ppm.			22.0 to 22.5 feet: SILT (ML); light brownish-gray; 85% fines, low plasticity; 15% sand, fine; trace gravels, fine to medium, subrounded; trace organic debris; trace woody debris; damp.
22									22.5 to 23.5 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.
23			100	CB		PID = 0ppm.			23.5 to 26.0 feet: GRAVELLY SILT (ML); light grayish-brown; 65% fines, medium plasticity; 35% gravels, fine to coarse, subangular; trace sand; moist.
24									26.0 to 29.0 feet: GRAVELLY SILT (ML); dark brownish-gray; 65% fines, medium plasticity; 35% gravels, fine to coarse, subangular; trace sand; strong sheen and odor; possible product; moist.
25			100	CB		PID = 29.7ppm.			29.0 to 33.0 feet: SANDY SILT (ML); dark brownish gray; 65% fines, low plasticity; 35% sand, fine; heavy sheen and odor; tarry-like impacts, possible product; moist.
26									33.0 to 35.0 feet: SILTY SAND (SM); dark grayish-brown; 40% fines, low plasticity; 60% sand, fine; subrounded clast approximately 5-inches in diameter; heavy sheen and odor; moist.
27			100	CB		PID = 8.1ppm.			35.0 to 35.5 feet: SAND (SP); light yellowish-brown; 100% sand, fine; trace fines, non plastic; heavy sheen and odor; moist.
28									35.5 to 38.5 feet: SAND (SP); dark brownish-gray; 100% sand, fine; trace fines, non plastic; heavy sheen and odor; globules; moist to wet.
29			90	CB		PID = 0ppm.			38.5 to 52.5 feet: SILTY SAND (SM); dark brownish-gray; 25% fines, non to low plasticity; 75% sand, fine; trace gravels, subangular; strong odor; wet.
30									
31			100	CB		PID = 8ppm.			
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
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Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)				
43										
44						PID = 0ppm.				
45										
46										
47						PID = 0ppm.				
48										
49										
50						PID = 0ppm.				
51										
52										
53						PID = 0ppm.				52.5 to 53.0 feet: SILT (ML); dark brownish-gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist to wet.
54										53.0 to 55.5 feet: SILTY SAND (SM); dark brownish-gray; 25% fines, non to low plasticity; 75% sand, fine; trace gravels, subangular; strong odor; wet.
55										
56			100	CB		PID = 0ppm.				55.5 to 56.0 feet: SILT (ML); dark brownish-gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist to wet.
57										56.0 to 58.0 feet: SAND WITH SILT (SP-SM); dark brownish-gray; 15% fines, non plastic; 85% sand, fine; strong odor; wet.
58										
59						PID = 0ppm.				58.0 to 66.0 feet: SILTY SAND (SM); dark brownish-gray; 15 to 20% fines, non to low plasticity; 75 to 80% sand, fine; trace cobbles, subrounded; strong odor; wet.
60										@ 60.0 feet: 3-inch silt layer.
61			90	CB						
62						PID = 0ppm.				
63										
64										@ 63.5.0 feet: odor becoming slight.
65										

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.
Geologic Borehole Log/Well Construction

 Project Number
8128.01.08

 Well Number
WS-14

 Sheet
4 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
66						PID = 0ppm.			
67			100	CB					66.0 to 67.0 feet: SANDY SILT (ML); dark grayish-brown; 80% fines, non to low plasticity; 20% sand, fine; micaceous; moderate odor; moist to wet.
68						PID = 0ppm.			67.0 to 69.5 feet: SAND (SP); dark grayish-brown; 5% fines, non plastic; 95% sand, fine; micaceous; no noticeable odor; moist to wet.
69									@ 68.0 feet: 2-inch silt layer.
70									69.5 to 70.0 feet: SILT (ML); dark gray; 85% fines, low plasticity; 15% sand, fine; moist.
71			0	CB		PID = 0ppm. WS14-W-71			70.0 to 71.0 feet: SAND (SP); dark grayish-brown; 5% fines, non plastic; 95% sand, fine; micaceous; moist to wet.
72									71.0 to 75.5 feet: NO RECOVERY.
73									
74									
75									
76			100	CB		PID = 9.4ppm.			75.5 to 81.5 feet: SAND (SP); dark brownish-gray; trace to 5% fines, non plastic; 95 to 100% sand, fine; micaceous; slight odor; wet.
77									
78			100	CB		PID = 0ppm.			
79									@ 79.0 feet: trace silty balls.
80									
81						PID = 0ppm.			
82									81.5 to 82.5 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; slight odor; wet.
83									82.5 to 83.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; moderate odor; wet.
84						PID = 0ppm.			83.5 to 84.3 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; slight odor; wet.
85									84.3 to 84.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; moderate odor; wet.
86						WS14-W-86			84.5 to 85.0 feet: SAND and SILT (SP-ML); dark gray; alternating 1/4-inch to 1/2-inch sand and silt layers; wet.
87						PID = 0ppm.			85.0 to 87.5 feet: SAND (SP); dark gray; 10% fines, non plastic; 90% sand, fine; micaceous; odor; wet.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
5 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Blows/6"	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)			
88		100		CB					87.5 to 88.0 feet: SANDY SILT (ML); gray; 60% fines, low to medium plasticity; 40% sand, fine; micaceous; moderate odor; wet.
89									88.0 to 89.5 feet: SILTY SAND (SM); gray; 15% fines, non plastic; 85% sand, fine; micaceous; slight odor; wet.
90						PID = 13ppm.			89.5 to 90.5 feet: SILT (ML); dark gray; 100% fines, medium plasticity; trace sand, fine; micaceous; moist.
91									90.5 to 92.0 feet: SILTY SAND (SM); gray; 15% fines, non plastic; 85% sand, fine; micaceous; sheen and strong odor; wet.
92									92.0 to 96.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand, fine; micaceous; sheen and strong odor; moist. Several zones of 2-inch pockets with fine sand.
93						PID = 28.3ppm.			
94									
95									
96		100		CB		PID = 0ppm.			96.0 to 98.0 feet: SANDY SILT (ML); dark gray; 85% fines, medium plasticity; 15% sand, fine; micaceous; strong odor; moist.
97									98.0 to 102.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; strong odor; wet. Between 99.0 and 99.5 feet several 1/2-inch silt bands intermixed with sand.
98									
99						PID = 0ppm.			
100									
101									@ 100.5 feet: 1-inch silt layer.
102						WS14-W-101			102.0 to 105.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; sheen and strong odor; wet.
103		100		CB		PID = 0ppm.			
104									
105						PID = 84ppm.			
106									105.0 to 105.5 feet: SILT (ML); gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist.
107									105.5 to 106.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; sheen and strong odor; wet.
108									106.0 to 108.0 feet: SILT (ML); gray; 100% fines; low plasticity; trace sand, fine; trace rootlets; moderate odor; moist.
109									@ 107.0 feet: 2-inch gray sand layer with strong odor.
110						PID = 9.5ppm.			108.0 to 108.5 feet: SILTY SAND (SM); gray; 30% fines, low plasticity; 70% sand, fine; sheen and strong odor; wet.
110									108.5 to 110.5 feet: SILT (ML); gray; 100% fines; low plasticity; trace sand, fine; sheen and strong odor; moist.
110									@ 109.0 feet: 4-inch silty sand layer with sheen and strong odor.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
6 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data		Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)			
111		100		CB		PID = 0ppm.			110.5 to 111.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; slight odor; wet. 111.0 to 113.0 feet: NO RECOVERY; sluff.
112									
113						PID = 0ppm.			113.0 to 114.0 feet: SANDY SILT (ML); dark brownish-gray; 60% fines, non to low plasticity; 40% sand, fine; micaceous; faint odor; moist to wet.
114									114.0 to 120.5 feet: SAND (SP); dark brownish-gray; 5% fines, non plastic; 95% sand, fine; micaceous; no noticeable odor; wet.
115									
116						PID = 0ppm.			@ 116.0 feet: 3-inch silt layer.
117									
118									
119						PID = 0ppm.			
120						WS14-W-120			
121		100		CB					120.5 to 121.0 feet: SILT (ML); dark brownish-gray; 85% fines, low plasticity; 15% sand, fine; micaceous; moist.
122									121.0 to 132.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.
123									
124						PID = 0ppm.			@ 124 feet: sheen and strong odor present.
125									
126									
127						PID = 0ppm.			
128									
129									
130						PID = 0ppm.			@ 130 feet: sheen and strong odor fading.
131									
132									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
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Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data		Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)			
133						PID = 0ppm.			132.5 to 133.5 feet: SILT (ML); dark grayish-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.
134									133.5 to 134.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.
135									134.0 to 134.5 feet: SILT (ML); dark grayish-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.
136		0	CB						134.5 to 136.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet. @ 135.5 feet: 3-inch silt layer.
137									136.0 to 138.5 feet: NO RECOVERY.
138									
139		100	CB			PID = 0ppm.			138.5 to 141.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; slight odor; wet.
140									
141									
142		100	CB			PID = 0ppm. WS14-W-142			141.5 to 142.0 feet: SILT (ML); dark brownish-gray; 85% fines, low plasticity; 15% sand, fine; micaceous; moist. @ 141.7 feet: 1-inch sand layer.
143									142.0 to 143.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.
144									143.0 to 145.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand; moist. @ 143.5 feet: 3-inch sand layer.
145						PID = 0ppm.			145.0 to 148.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; intermixed with 1-inch to 2-inch sand layers; moist.
146									
147									
148									
149						PID = 0ppm.			148.5 to 149.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.
150		100	CB			WS14-W-150			149.0 to 149.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand; moist.
151									149.5 to 150.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.
152						PID = 0ppm.			150.0 to 167.0 feet: SAND (SP); gray; 5% fines, non plastic; 95% sand, fine to medium; trace wood debris; wet. @ 152.0 feet: 2-inch silt layer.
153									
154									
155									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
8 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
156						PID = 0ppm.			@ 155.0 feet: Wood fragments.
157									
158						PID = 0ppm.			@ 157.0 feet: 3-inch silt layer.
159									
160									
161						PID = 0ppm.			
162									
163									
164						PID = 0ppm.			
165									
166									
167						PID = 0ppm.			167.0 to 167.5 feet: NO RECOVERY; sluff.
168						WS14-W-167			167.5 to 169.5 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
169									
170						PID = 0ppm.			169.5 to 172.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; increasing fines to 15%; wet.
171									
172									172.0 to 173.0 feet: SILTY SAND (SM); gray; 35% fines, non plastic; 65% sand, fine; wet.
173						PID = 0ppm.			173.0 to 182.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
174									
175									
176						PID = 0ppm.			
177									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
9 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data		Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)			
178						PID = 0ppm.			
179									
180									
181									
182		80	CB			PID = 0ppm. WS14-W-182			182.0 to 185.5 feet: NO RECOVERY; sluff.
183									
184									
185									
186						PID = 0ppm.			185.5 to 186.5 feet: Sand (SP); gray; 100 % sand, fine; micaceous; trace fines; wet.
187									186.5 to 188.0 feet: SILTY SAND (SM); gray; 35% fines, low plasticity; 65% sand, fine; wet.
188									
189						PID = 0ppm.			188.0 to 190.0 feet: SILT (ML); gray; 100% fines, low to medium plasticity; damp. @ 189.0 feet: 2-inch fine, sand layer.
190									
191									190.0 to 195.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
192		100	CB			PID = 0ppm.			
193									
194									
195						PID = 0ppm.			195.0 to 196.0 feet: SILTY SAND (SM); gray; 50% fines, low plasticity; 50% sand, fine; wet.
196									196.0 to 197.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
197		90	CB			WS14-W-197			197.0 to 198.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; damp.
198						PID = 0ppm.			198.0 to 204.0 feet: SAND (SP); gray; 100% sand, fine to medium; micaceous; trace fines; wet.
199									
200									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
10 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data		Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)			
201						PID = 0ppm.			
202									
203									
204						PID = 0ppm.			
205									204.0 to 208.0 feet: GRAVEL with SILT (GW-GM); gray; 15% fines, non plastic; 85% gravels, fine to coarse, subangular to subrounded; wet.
206									
207									
208									
209						WS14-W-208			208.0 to 210.0 feet: BASALT; light gray to dark gray; moist to wet; bedrock. (Columbia River Basalt Group) Significant increase in resistance, drilling hardness.
210									

Total Depth = 210.0 feet.

WS14 Completion Details

Oregon Water Resources Department Well Start Card Number: 164731
Oregon Water Resources Department Well Identification Number:
L67967

Boring:

0.0 to 69.0 feet bgs: 10-inch temporary, threaded steel, isolation casing.
0.0 to 110.0 feet bgs: 9-inch temporary, threaded steel, isolation casing.
0.0 to 135.0 feet bgs: 8-inch temporary, threaded steel, isolation casing.
0.0 to 210.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
0.0 to 210.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.5 feet bgs: flush mount vault and cement seal.
1.5 to 7.0 feet bgs: 1/4-inch Baroid bentonite chips hydrated with potable water.
7.0 to 104.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
106.0 to 125.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
125.0 to 140.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.
140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
161.0 to 210.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)				
<div><div><u>Well WS14-125:</u> 0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe. 109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot. 124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.</div><div><u>Well WS14-161:</u> 0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe. 145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot. 160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.</div></div>										
<div><div>NOTES:</div><div>1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.</div></div>										

ATTACHMENT B

SPECIAL STANDARDS





Oregon

John A. Kitzhaber, MD, Governor

Water Resources Department

North Mall Office Building
725 Summer St NE, Suite A
Salem, OR 97301
Phone (503) 986-0900
Fax (503) 986-0904
www.wrd.state.or.us

January 26, 2015

TRENT CASTNER MWC# 10306
CASCADE DRILLING LP
13600 SE AMBLER ROAD
CLACKAMAS, OREGON 97105

FINAL ORDER

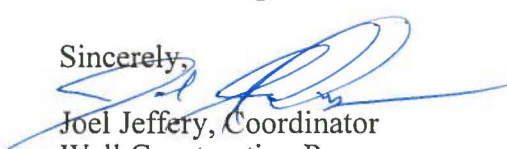
Dear Mr. Castner:

The Special Standards Request Form you submitted for owner: Siltronic Corporation, Start Card number 1025432 (Client Number WS-11) is hereby approved for the following: You may abandon this nested monitoring well as described in your Special Standards Request Form. You may use an Organoclay based grout (see attached) to abandon the over drilled monitoring well in the intervals where NAPL is present. In intervals where NAPL is not present an approved sealing material shall be used. ***If you are going to use bentonite grout to abandon the well, then it may only be used to abandon the portion of the well that is below the static water level. Above the static water level another approved sealing material must be used.*** A copy of your Special Standards Request Form is enclosed. All other standards must be adhered to.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions regarding this letter, I may be contacted at (503) 986-0852, or by e-mail at Joel.W.Jeffery@wrdd.state.or.us.

Sincerely,



Joel Jeffery, Coordinator
Well Construction Program
Well Construction and Compliance Section

enclosure

cc: NW Region Well Inspector
File

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.





Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us

Special Standards Request Form

REQUEST FOR WRITTEN APPROVAL TO USE CONSTRUCTION METHODS NOT INCLUDED IN OREGON ADMINISTRATIVE RULES 690-200 THROUGH 690-240

Before the request can be considered, this form must be completed. Requests shall be submitted to the Well Construction Program Coordinator, Water Resources Department, 725 Summer Street NE, Suite A, Salem OR 97301-1266. Requests may also be considered by the appropriate Regional Manager.

Date of request: 1/21/2015 Oral approval date (if applicable): _____

Bonded Well Constructor (name, license #, and mailing address): Trent Castner 10306

13600 SE Ambler RD, Clackamas, OR 97105

(1) Location of Well: SW 1/4 SW 1/4 Tax lot 1200 Section 13,

Township 1 N, Range 1 W, Multnomah County

Address at well site: 7200 NW Front Ave., Portland, OR

(2) Start Card Number(s)(for work to be done): 1025432

(3) Name and Address of Land Owner: Siltronic Corporation

7200 NW Front Ave, Portland, OR

(4) Distance to the nearest septic tank, drainfield, closed sewage line (if water supply well)

Unknown

(5) The unusual site conditions which necessitate this request: Abandonment of a nested

well in a known NAPAL contaminated zones which will prevent the hydration of the bentonite in

the high solids slurry.

(6) The proposed construction methods that the bonded well constructor believes will be adequate for this well: (attach additional pages if needed)

I propose that we overdrill the nested well (original start card number 147655 client number WS-11) and that we

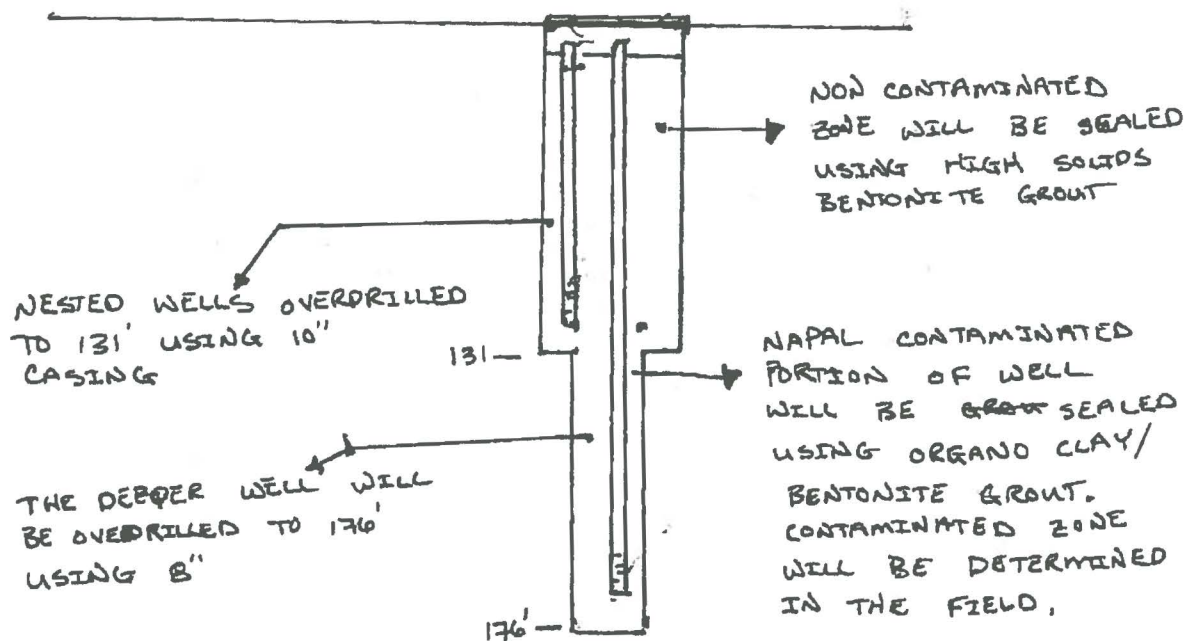
use a high solids bentonite grout combined with Oragano Clay in the zones determined to

be contaminated with NAPAL. The rest of the well borehole will be abandoned using high solids benonitic slurry.

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JAN 23 2015
ENF

- (7) Diagram showing the pertinent features of the proposed well design and construction:
(attach additional pages if needed)



NOT TO SCALE. SEE ATTACHED ORIGINAL WELL LOG

PLEASE NOTE:

- (1) The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.
- (2) If it should be determined at some future date that the well, due to its construction, is allowing ground water contamination, waste or loss of artesian pressure, the undersigned shall return to the site and rectify the problem.
- (3) If oral approval was granted, a written request must be submitted to the Department either within three (3) working days of the date of oral approval or prior to the completion of the associated well work. Failure to submit a written request as described above may void prior oral approval.

I have read and understand the above information. I further attest that the information provided is accurate to the best of my knowledge.

Bonded Constructor Signature: _____

SEE ATTACHED WORK PLAN

Revised 7/26/2006

Special Standards Request Form /2

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JAN 23 2015

WATER RESOURCES DEPT
SALEM, OREGON

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

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September 18, 2008

SEP 29 2008

Mr. Kristopher Byrd
Oregon Water Resources Department
Well Construction and Compliance Section
725 Summer 450 42nd Street NE, Ste A
Salem, Oregon 97310

WATER RESOURCES DEPT
SALEM, OREGON

HAI Project Nos. 2708 and 5237
DEQ ECSI File No. 84

**SUBJECT: Alternative Grout Slurry for Borehole Abandonment and Seal for
Permanent Groundwater Monitoring Wells, NW Natural Gasco Property,
7900 NW St, Helens Road and Siltronic Corporation Property, 7200 NW
Front Avenue, Portland, Oregon**

Dear Mr. Byrd:

Hahn and Associates, Inc. (HAI), on behalf of NW Natural, is requesting approval from the Oregon Water Resources Department (OWRD) for the use of a site-specific bentonite grout for soil boring abandonment work and well sealant for future groundwater monitoring or groundwater extraction wells installed as part of site investigation and cleanup activities at the above referenced contiguous properties (the Site).

NW Natural is conducting investigation and clean-up activities at the Site with oversight from the Oregon Department of Environmental Quality. The site has been impacted predominantly by polynuclear aromatic hydrocarbons, benzene, and cyanide. Trichloroethene and related degradation products have also been detected. Dissolved phase contamination and dense non aqueous phase liquid (DNAPL – a creosote-like oil with a density greater than water) are present at the Site.

As specified in OAR 690-240-0475, well seal material shall consist of a physically and chemically stable hydrated grout consisting of 1) neat cement; or 2) sodium bentonite; or 3) a cement-bentonite grout mixture containing no more than 5 percent bentonite by dry weight; or 4) sodium bentonite granules, pellets, or chips placed in an unhydrated state and subsequently hydrated downhole. OAR 690-240-0475 acknowledges that appropriate sealing materials may vary depending on site characteristics and substances being monitored.

As part of the pre-design process related to a pending source control action at the Site, Glynn Geotechnical Engineering has recently completed testing the compatibility and effectiveness of various bentonite and cement grout slurry sealing materials with contaminated groundwater and dense non aqueous phase liquids (DNAPL) obtained from the site. As provided within the attached letters of August 22 and 28, 2008 (Mark Glynn to Mike Crystal), it has been determined that a bentonite / Organoclay blend, consisting of approximately 9 parts Wyoming sodium bentonite and 1 part Organoclay by volume, and mixed to a 20% solids content, will be a superior sealant as compared to the sodium bentonite or cement bentonite grout slurries specified in OAR 690-240-0475.

The specific mixture that has been tested and recommended for use consists of granular CETCO Volclay CG-50 and PM-200 Organoclay. Technical data sheets for both of


these products are attached. A technical reference document is also attached that describes the applicability and function of Organoclay as a sealant in situations where high concentrations of organic contaminants are present. Please be advised that although the CG-50 product is not marketed by CETCO as a well seal material, the supplier has indicated that it is the same bentonite source that is marketed for differing uses under various names. An advantage to the CG-50 and PM-200 Organoclay mixture is that granular sizing of the two products is similar which better ensures a homogenous blend, and that CETGO can pre-mix and bag the 9:1 bentonite / Organoclay blend – thereby eliminating the need to prepare the proper blend in the field.

Testing by Glynn Geotechnical Engineering has determined that to achieve a slurry that is 20% solids (by volume), a single bag of the blend weighing 50 pounds should be mixed with 18.26 gallons of water. The solution should be blended with an electric paddle mixer. The resulting mud weight of the 20% solids solution will be 71.7 pounds per cubic foot (plus or minus 1 pound per cubic foot). The preceding equates to a mud weight of between approximately 9.5 to 9.7 pounds per gallon at a 20% solids content.

We are seeking approval from OWRD and DEQ to use the bentonite / Organoclay grout slurry mixture described above for those applications necessitating the use of a grout slurry sealant. All requirements concerning placement method and appropriate depth of placement within the borehole or well annulus, as well as verification of the appropriate mud weight, will remain as specified within OAR 690-240. Approval from the DEQ for use of the bentonite / Organoclay grout slurry described herein is being requested concurrently with this request to OWRD.

Should you have any questions, please contact the undersigned.

Sincerely,



Rob Ede, R.G.

Principal

robe@hahnenenv.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Mr. John Edwards, Anchor Environmental, L.L.C.
Mr. Dana Bayuk, DEQ NW Region
Mr. Henning Larsen, DEQ NW Region
Mr. Tom Gainer, DEQ NW Region
Mr. Tom McCue, Siltronic Corporation

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WATER RESOURCES DEPT
SALEM, OREGON

ATTACHMENT A

**Glynn Geotechnical Engineering Documentation:
Well Seal Evaluation and Recommendations**

**Correspondence dated:
August 22, 2008 and August 29, 2008**

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**WATER RESOURCES DEPT
SALEM, OREGON**



a member of the GLYNN GROUP

August 22, 2008

Sevenson Environmental Services
2749 Lockport Road
Niagara Falls, NY 14304

ATTN: Mr. Michael D. Crystal
Vice President

SUBJECT: Well Seal Evaluation
Gasco Site, Portland Oregon
GGE 05-1043C

Dear Mr. Crystal:

In response to your request I have reviewed the current issue regarding the failure of sealing materials in groundwater wells at the Gasco site. Based on substantive test data, it is my professional opinion that the bentonite/organo clay blend would be an effective replacement for plain bentonite grout in the construction of groundwater monitoring wells at the Gasco site.

By way of a few past projects, Glynn Geotechnical Engineering (GGE) has tested a recipe of bentonite and organo clay as a sealant against groundwater that contained significant DNAPL hydrocarbons. In each and every case the bentonite/organo clay blend, consisting of approximately 9 parts Wyoming bentonite and 1 part organo clay by volume, has demonstrated a compatibility with the groundwater at a permeability of less than $1.0E - 007$ cm/sec. In general, the testing has indicated the permeability tends to decrease over time as result of continuing swell characteristics of the blend.

Within the past month a test of the compatibility/permeability of the blend was completed for the Gasco project. In this test the blend was tested against the site groundwater and effectively demonstrated that the bentonite/organo clay would be an effective seal for Sevenson's patented sheeting system.

In our tests we have used bentonite identified as CETCO and Volclay. Results of our tests indicate no remarkable differences in the results from the different bentonites. These results tend to substantiate the supplier claims that the same Wyoming bentonite is sold under different names. Therefore, my recommendation for the use of the bentonite/organo clay blend is made irrespective of the identifier for the bentonite. Specifically I would support the use of CETCO Pure Gold Grout for the bentonite portion of the blend.

Please do not hesitate to contact me with any questions or comments.

Sincerely,

Mark W. Glynn, P.E.

Consulting Engineer, Principal

Oregon: 80419 P.E.

GLYNN GEOTECHNICAL ENGINEERING

415 South Transit Street, Lockport, New York 14094
voice 716.625.6933 / fax 716.625.6983
www.glynnngroup.com

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WATER RESOURCES DEPT
SALEM, OREGON

Civil • Structural • Geotechnical • Materials Testing • Consulting



a member of the GLYNN GROUP

August 29, 2008

Sevenson Environmental Services
2749 Lockport Road
Niagara Falls, NY 14304

Attn: Mr. Michael D. Crystal

SUBJECT: Well Seal Material Standards
Gasco Site, Portland Oregon
GGE 05-1043C

Dear Mr. Crystal:

On August 22, 2008 I sent you a letter regarding my evaluation of a bentonite/organo clay blend that would serve as a proper seal for monitoring wells at the Gasco Site. The proposed blend is comprised of 90% bentonite and 10% Organo Clay by volume.

To achieve a solution of 20% solids (by volume), a single bag of the blend weighing 50 pounds should be mixed with 18.26 gallons of water. The mud weight of the solution, as testing in the lab is 71.7 pcf. This unit weight was determined 15 minutes after the addition of water. The field measured unit weight should be expected to vary by no more than 1.0 pcf. We suggest that the solution be blended with an electric paddle mixer.

Please contact me directly if you need additional information.

Sincerely,

Mark W. Glynn, P.E.
Consulting Engineer, Principal

Civil • Structural • Geotechnical • Materials Testing • Consulting

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415 South Transit Street, Lockport, New York 14094
voice 716.625.6933 / fax 716.625.6983
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ATTACHMENT B

Technical Data Sheets:

CETCO Volclay CG-50
and
CETCO PM-200 Organoclay

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WATER RESOURCES DEPT
SALEM, OREGON

HAHN AND ASSOCIATES, INC.



Physical Properties

Volclay® CG-50

Description:	Volclay CG-50 is a natural, granular, high-swelling Wyoming sodium bentonite recommended for lining/sealing applications involving moist soils or those where it is necessary to minimize dust generation.									
Applications:	Soil/bentonite liners; general sealing applications									
Composition:	Sodium bentonite is a hydrous silicate of alumina primarily consisting of the clay mineral montmorillonite, which swells several times its own volume when, wetted.									
Free Swell	24 ml/2g minimum (ACC 1010)									
Filtrate Loss:	18 ml maximum (API 13A)									
Moisture Content:	12 percent maximum as shipped									
Particle Sizing:	5 percent max. retained on a #10 mesh (2.00 mm) sieve 15 percent max. passing a #200 mesh (75 mm) sieve (ASTM D422)									
Dry Bulk Density:	65 lbs/ft ³ (1,040 kg/m ³) typical									
Packaging:	50 lb (22.5 kg) multi-wall paper bags; 2000-lb (900 kg) or 4,000 lb (1,800 kg) super sacks; or bulk.									
Availability:	F.O.B. Lovell, WY. Quantities less than 1 ton may be available locally.									
Application Information:	<table><tr><th>Primary Soil Type</th><th>Typical Application Rate*</th></tr><tr><td>Sand</td><td>8-10 lbs/ft² (40-50 kg/m²)</td></tr><tr><td>Silt</td><td>4-8 lbs/ft² (20-50 kg/m²)</td></tr><tr><td>Clay</td><td>2-4 lbs/ft² (10-20 kg/m²)</td></tr></table> <p>*Application rates are for a soil/bentonite liner mixed in a layer 6 inches (150mm) in thickness with a permeability of 1×10^{-7} cm/sec. Application rates above are shown for informational purposes only. All soils should be tested to determine specific application rates.</p>		Primary Soil Type	Typical Application Rate*	Sand	8-10 lbs/ft ² (40-50 kg/m ²)	Silt	4-8 lbs/ft ² (20-50 kg/m ²)	Clay	2-4 lbs/ft ² (10-20 kg/m ²)
Primary Soil Type	Typical Application Rate*									
Sand	8-10 lbs/ft ² (40-50 kg/m ²)									
Silt	4-8 lbs/ft ² (20-50 kg/m ²)									
Clay	2-4 lbs/ft ² (10-20 kg/m ²)									

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SEP 29 2008

WATER RESOURCES DEPT
SALEM, OREGON

Revised 3/03

1500 W. Shure Drive • Arlington Heights, IL 60004 • USA • (847) 392-5800 • FAX (847) 577-5571 /www.CETCO.com
A wholly owned subsidiary of AMCOL International

The information and data contained herein are believed to be accurate and reliable. CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information.



Technical Data

PM-200 ORGANOCLAY

MATERIAL PROPERTY	TEST METHOD	VALUE
Bulk Density Range	CETCO Test Method	44 – 56 lbs/ft ³
Particle Size Distribution	US Standard Sieve Size	
	No.10 (Retained)	1% Maximum
	No.30 (Retained)	70% Minimum
	No.50 (Retained)	25% Maximum
	No.100 (Retained)	3% Maximum
	No.100 (Passing)	1% Maximum
Hydraulic Conductivity	ASTM D 5084 modified	1×10^{-3} cm/sec minimum
Oil Adsorption Capacity	CETCO Test Method	0.5 lb of oil per lb of Organoclay minimum
Quaternary Amine Content	CETCO Test Method	25 – 33% quaternary amine loading

A proprietary granular clay compound that reliably adsorbs oil and similar organics from water.

Packaging – 1,500 lb. supersacks (with approximately 22-24 tons per flatbed truck).

Rev. 3 - 8/8/07



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SEP 29 2008

WATER RESOURCES DEPT
SALEM, OREGON

1500 West Shure Drive 5th Floor, Arlington Heights, IL 60004 USA 800.527.9948 Fax 847.577.5566
For the most up-to-date product information please visit our website, www.sedimentremediation.com
A wholly owned subsidiary of AMCOL International Corporation

The information and data contained herein are believed to be accurate and reliable, CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information.

ATTACHMENT C
CETCO Technical Reference
Organoclay Media as a Sealant Additive

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SEP 29 2008

**WATER RESOURCES DEPT
SALEM, OREGON**



UTILIZING ORGANOCLAY™ MEDIA AS A SORBENT ADDITIVE TO DECREASE ORGANIC MOBILITY AND HYDRAULIC CONDUCTIVITY

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BACKGROUND

Organic contaminants migrating with groundwater sources continue to offer significant challenges in terrestrial remediation applications. While selective media such as granular activated carbon (GAC) have proven to be successful at adsorbing soluble organics, these media may have reduced performance due

to blinding in the presence of high molecular weight organic matter and may be prematurely saturated due to the active sites competing for inorganic matter as well as the organic contaminants of concern. An alternative technology is emerging that addresses this problem with a clay-based adsorption media, which effectively and efficiently stabilizes low-soluble organic matter. Organoclay™ Media utilizes granular sodium bentonite clay, which has been chemically modified to attract organic matter without absorbing water. The unique platelet structure of bentonite provides tremendous surface area and the capacity of the media to adsorb over 60 percent (by weight) in organic matter.

Organoclays have been utilized as additives to permeable reactive barriers (PRB), amendments to soil liners and as a soil stabilization agent to reduce the transport of organic contaminants. The primary focus has been on the ability for this specialty sorbent to effectively adsorb low soluble organic matter from aqueous solutions. Organoclay has been also been used as an additive to soil containment barriers and low permeable slurry walls. It has been shown to reduce transport of organic contaminants and improve the hydraulic conductivity characteristics when petroleum based hydrocarbons are present. (Boldt-Leppin, Haug and Headley, 1996).

APPLICABILITY AS A SOIL SEALANT

Sodium bentonite clay has been utilized as soil admix for hydraulic barriers for a variety of remedial applications. The primary benefit of utilizing this specialty mineral is the fact that it is very hydrophilic and swells many times (by volume) in the presence of fresh water. The result is a barrier of very low hydraulic conductivity ($< 10^{-9}$ m/s typical). The design of these barrier systems has focused on minimizing the flow of water. However, even with hydraulic conductivities of less than 10^{-7} cm/s, the mass flux of many organic contaminants can be significant. While bentonite clay is able to minimize the advective flow of suspended contaminants, transport due to molecular diffusion can be a critical transport mechanism (Lake and Rowe, 2000, 2004). The inability of typical clays to impede diffusive transport has lead to new research on utilizing Organoclay and other specialty sorbents to amend standard bentonite-soil barriers. Recent studies have shown that hydraulic conductivity of sodium bentonite and earthen barriers amended with 3% (by weight) of certain types of Organoclay met or surpassed regulatory requirements of 1×10^{-7} cm/s. More importantly, transport simulations indicated that these modified barriers can retard benzene transport. (Hunt, Smith, Burns and Rabideau, 2005).

APPLICABILITY IN SOIL-BENTONITE SLURRY WALLS

Slurry walls are physical barriers used to contain or direct the flow of groundwater. Most slurry walls are constructed of native soils, bentonite clay and water mixture. Portland cement and other self

TR 828
1/2007

800.527.9948 Fax 847.577.5566

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hardening components are also often used if the design requires lower permeability ($< 10^{-7}$ cm/s) or higher compressive strength. While these engineered barriers have long been used in construction applications to control seepage, they continue to gain popularity in remedial applications for the containment and redirection of contaminated groundwater. When constructing slurry walls, permeability is the critical parameter for designers and regulators. However, incompatibilities between traditional construction materials and site contaminants (if they are organic in nature) have lead to the development of new compositions of traditional soil-bentonite slurry walls. These new designs include specialty sorbents to more effectively contain shorter chain hydrocarbons and other organic matter that may be capable of passing through barriers with permeability as low as 10^{-7} cm/s. When mixed in to a standard slurry wall mix at a 2% (by weight) addition rate, Organoclay has proven to effectively minimize the migration of medium to light hydrocarbons previously passing through the barrier. Furthermore, within 14 days the perm value of the amended slurry wall was almost an order of magnitude lower than the standard bentonite formulation.

APPLICABILITY AS A SPECIALTY GROUT

Sheet piling consists of a series of panels with interlocking connections, driven into the ground to form an impermeable barrier. These panels can be constructed from a variety of materials such as steel, vinyl and plastic depending on the site specific contaminants present. While these specialty engineered barriers have proven to be impervious to aqueous solutions and migrating organic matter, they are sometimes susceptible to these solutions passing through the interlocking joints if not installed and sealed properly. A new specialty grout incorporating Organoclay and high swelling sodium bentonite clay has proven successful in creating an impermeable seal in the open cavities within these joints. Furthermore, the addition of Organoclay to this grout ensures that organic material migrating with these solutions will not pass beyond the piling. Grouts of this type may be used to seal known areas of high infiltration or permeable formations.

SUMMARY

Terrestrial remediation projects for organic contaminants pose many challenges for traditional technologies. Organoclay amendments to PRBs, soil liners, GCLs, slurry walls and grouts may be used to improve their performance preventing migration of these organic contaminants in both permeable and impermeable engineered barriers. Because individual site characteristics vary, project specific testing should be conducted to determine applicability.

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MAUL FOSTER ALONGI

2001 NW 19th Avenue, Suite 200 | Portland, OR 97209 | 971 544-2139 | www.maulfooster.com

November 7, 2014
Project No. 8128.01.08

Mr. Dana Bayuk
Oregon Department of Environmental Quality
2020 SW 4th Avenue
Portland, Oregon 97201-4987

Re: Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan
Siltronic Corporation
7200 NW Front Avenue, Portland, OR
ECSI No. 183

Dear Dana:

On behalf of Siltronic Corporation (Siltronic), Maul Foster & Alongi, Inc. (MFA) has prepared this letter in response to direction from the Oregon Department of Environmental Quality (DEQ) to abandon nested monitoring well pairs WS-11 and WS-14 on the Siltronic property. Direction to abandon WS-14 was provided in DEQ's January 28, 2014 e-mail correspondence to Siltronic documenting a January 27, 2014 telephone conversation.

The initial version of this work plan was submitted to DEQ on February 14, 2014 to which DEQ responded in an email dated April 10, 2014. DEQ's April 10th email informed Siltronic that there were insufficient details regarding the well abandonment procedures and provided their approval to proceed with the well inspection video logging for WS-14-125/161 to support scoping and planning of the abandonment work. The video log inspection of the WS-14 monitoring well pair was submitted to DEQ on April 25, 2014. DEQ responded with comments in an email dated June 25, 2014. MFA incorporated DEQ comments and submitted a revised work plan on July 25, 2014. On September 18, 2014, DEQ responded with comments in a letter *Abandonment of the WS-11 and WS-14 Monitoring Well Clusters and Installation of a Deep Monitoring Well* and requested that a revised work plan be submitted to DEQ by October 6, 2014. To expedite DEQ's review, MFA provided a draft of the revised text to DEQ on October 6th prior to the final document being produced. DEQ responded in a letter on October 22nd with their approval of the final document and implementation subject to incorporating their comments. This Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan is a revision of previous versions and incorporates DEQ's September 18th and October 22nd comments; a separate submittal will be provided addressing DEQ's September 18th request for a replacement monitoring well. For reference, DEQ correspondence is included in Attachment A.

BACKGROUND

The nested monitoring well pairs WS-14 and WS-11 are located near the north (and northwest) corner of the Siltronic property as shown in the attached figure. The wells were

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completed in October 2003 (WS-11) and July 2004 (WS-14) and constructed in accordance with then-approved DEQ and Oregon Water Resources Department (OWRD) design specifications of 2-inch diameter, flush threaded, Schedule 40 polyvinyl chloride (PVC) riser pipe; and 2-inch diameter, stainless steel wire wrapped 0.010-inch slot screen; and 2-inch diameter stainless steel sump.

Monitoring well WS-11-125 was completed to 125 feet below ground surface (bgs) and monitoring well WS-11-161 was completed to 161 feet bgs, the same completion depths correlate with WS-14-125 and WS-14-161, respectively. The screened interval is 15 feet in primarily silt and sand for all four wells with a 1 foot sump at the bottom. The monitoring well construction logs are included in Attachment B.

The monitoring well pair WS-11 is identified by OWRD as well log ID "MULT 72126". For monitoring well pair WS-14, the OWRD log "MULT 73686" reports the well number as WS-13, but the reported well number appears to be incorrect. The correct OWRD well log file for WS-14 is "MULT 73686." The OWRD well logs are included in Attachment C.

Per DEQ direction in their email dated January 28, 2014, a video inspection of the inside of monitoring wells WS-14-125 and WS-14-161 was completed to identify the potential causes for the presence of manufactured gas plant (MGP) dense, non-aqueous phase liquid (DNAPL) in WS-14-161. The video logs were submitted to DEQ on April 25, 2014 for review showing the joints in the WS-14 well pair to be intact. At that time, only the WS-14 well pair was scheduled to be abandoned. In the DEQ email dated June 25, 2014, DEQ directed Siltronic to also abandon well pair WS-11-125 and WS-11-161.

MONITORING WELL DECOMMISSIONING

Public and private utility-locating services and other information sources will be used to check for underground utilities before work begins. MFA will coordinate fieldwork to locate possible on-site utilities and piping or other subsurface obstructions. Prior to overdrilling, an air knife will be used to 10 feet bgs around the wells to verify clearance from potential subsurface obstructions. For reference, site features near WS-11 and WS-14, including known utility lines and monitoring wells, are shown on the attached figure.

The monitoring well abandonment will be conducted in accordance with applicable regulations including Oregon Administrative Record (OAR) 690-240-0510, DEQ Guidance Document titled Groundwater Monitoring Well Drilling, Construction, and Decommissioning¹, and previously approved protocols for abandoning monitoring wells at the NW Natural and Siltronic sites including an OWRD variance to use bentonite or organoclay/bentonite slurry if MGP DNAPL is encountered.

The abandonment procedures will include, but not be limited to, the following:

¹ DEQ. 1992. Groundwater Monitoring Well Drilling, Construction, and Decommissioning. Technical Guidance. Oregon Department of Environmental Quality. August 24.

- Measuring the depth to water and depth to bottom of the monitoring well
- Checking for the presence of MGP DNAPL and measuring its depth and thickness in each of the four monitoring wells, where present DNAPL will be removed to the maximum extent practicable before well abandonment work is initiated
- Using a sonic drilling rig, overdrilling the 2-inch-diameter PVC/steel monitoring wells to the depth necessary to confirm the removal of well construction materials:
 - A 10-inch casing will be used from ground surface to a minimum of 5-feet below the bottom of the sand pack (approximately 130 feet bgs) at monitoring wells WS-11-125 and WS-14-125. Advancement of the 10-inch casing may continue depending on observations made in the field of the material from this depth, then
 - An 8-inch casing will be used to remove the remaining well construction materials to the bottom of the borehole.
- The WS-14 monitoring well cluster will be overdrilled to minimum depth of 15-feet below the bottom of the filter pack for WS-14-161. The material retrieved from below the bottom of the filter pack will be visually inspected for evidence of DNAPL. If evidence of DNAPL is observed then the boring will be advanced ten additional feet and the material from the bottom of the borehole will be inspected for evidence of DNAPL. This process will be repeated until no evidence of DNAPL is observed at which time borehole sealing will proceed.
- Unless DNAPL is detected in monitoring well WS-11-161, the WS-11 monitoring well cluster will be overdrilled to a minimum of 5-feet below the bottom of the filter pack for WS-11-161 to ensure the complete removal of casing, screen, and sand from the borehole. In the event DNAPL is detected in WS-11-161 Siltronic will follow the overdrilling procedure for the WS-14 monitoring well cluster.
- Consistent with site-specific requirements for preparation and use (i.e., OWRD-approved variance), organoclay-bentonite sealant will be used throughout the depth intervals where available information (e.g., boring logs, TarGOST® logs, observations made during abandonment work) provides evidence of DNAPL occurrence.
- Use of the organoclay-bentonite mix will be documented in detail. Documentation should include but is not limited to, Siltronic providing the basis for identifying the depth interval(s) where the organoclay-bentonite sealant was used; mud-weight measurements for each volume of slurry mixed and pumped downhole; the total volume of slurry used; and the estimated depth of slurry placement.
- The remaining portions of the borehole will be sealed using materials consistent with the requirements of OAR 690-240-510
- Surface completion to match the surrounding area

Mr. Dana Bayuk
November 7, 2014
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Project No. 8128.01.08

- Monitoring well construction materials, soil, decontamination liquid and groundwater generated during the well abandonment will be contained and staged on-site. Well abandonment materials will be characterized and managed consistent with the procedures established for investigation derived waste generated within the TCE Contaminated Material Management Area.

REPORTING

MFA will submit a report to DEQ documenting the abandonment work within 45 days of completing the fieldwork.

SCHEDULE

MFA is prepared to begin work upon DEQ review and approval of the proposed approach, subject to availability of subcontractors.

Sincerely,

Maul Foster & Alongi, Inc.



Kerry-Cathlin Gallagher
Project Scientist



James G.D. Peale, RG
Principal Hydrogeologist

Attachment: Figure
Attachment A—DEQ Correspondence
Attachment B—Monitoring Well Completion Logs
Attachment C—OWRD Well Logs

cc: Myron Burr, Siltronic Corporation
Alan Gladstone, Davis Rothwell Earle & Xochihua, P.C.
Ilene Gaekwad, Davis Rothwell Earle & Xochihua, P.C.
William Earle, Davis Rothwell Earle & Xochihua, P.C.
Chris Reive, Jordan Ramis
Keith Johnson, DEQ
Tom Gainer, DEQ
Henning Larsen, DEQ
Kristopher Byrd, OWRD
Sean Sheldrake, EPA
Rich Muza, EPA
Lance Peterson, CDM Smith

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Scott Coffey, CDM Smith
Bob Wyatt, NW Natural
Patty Dost, Pearl Legal Group, LLC
John Edwards, Anchor QEA, LLC
John Renda, Anchor QEA, LLC
Rob Ede, Hahn and Associates, Inc.

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FIGURE



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Source: Aerial photograph obtained from Esri ArcGIS Online.

Note:
Locations are approximate
and shown for reference only.

Legend

- NW Natural Station
- ⊕ Siltronic Monitoring Well
- ◆ TarGOST Boring
- - - Utility Line (Siltronic)
- Siltronic Tax Lot

Figure
Monitoring Well WS-14
and WS-11 Locations

Siltronic Corporation
Portland, Oregon

0 20 40
Feet



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ATTACHMENT A

DEQ CORRESPONDENCE



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Oregon

John A. Kitzhaber, MD, Governor

Department of Environmental Quality

Northwest Region Portland Office

2020 SW 4th Avenue, Suite 400

Portland, OR 97201-4987

(503) 229-5263

FAX (503) 229-6945

TTY (503) 229-5471

September 18, 2014

Also Sent Via E-mail

Mr. Myron Burr
Siltronic Corporation
7200 Front Avenue, M/S 30
Portland, OR 97210-3676

**Re: Abandonment of the WS-11 and WS-14 Monitoring Well Clusters and Installation of a Deep Monitoring Well
Siltronic Corporation Facility
Portland, Oregon
ECSI No. 183**

Dear Mr. Burr:

The Oregon Department of Environmental Quality (DEQ) reviewed the "Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan - Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI No. 183" dated July 25, 2014 (Revised Abandonment Plan). The Revised Abandonment Plan provides the approach Siltronic Corporation (Siltronic) proposes using to abandon the WS-11 and WS-14 nested double-completion monitoring well clusters. Maul Foster and Alongi, Inc. (MFA) prepared the Revised Abandonment Plan on behalf of Siltronic.

The primary purpose of this letter is to inform Siltronic that DEQ:

- Approves the Revised Abandonment Plan subject to the document being revised as indicated in this letter; and
- Requires a monitoring well to be drilled and constructed in the vicinity of the WS-11 cluster to replace the two deep installations being abandoned.

DEQ's condition for approving the Revised Abandonment Plan and additional information regarding drilling and installing the deep monitoring well are provided below.

Abandonment of the WS-11 and WS-14 Monitoring Well Clusters

DEQ approves the Revised Abandonment Plan subject to the condition that the document be revised to include the following steps:

- In addition, to checking for the presence of dense non-aqueous phase liquid (DNAPL) and measuring its thickness in each of the four monitoring wells, where present DNAPL will be removed to the maximum extent practicable before abandonment work is initiated.
- Unless DNAPL is detected in monitoring well WS-11-161, the WS-11 monitoring well cluster will be overdrilled to a minimum of 5-feet below the bottom of the filter pack for WS-11-161 to ensure the complete removal of casing, screen, and sand from the borehole. In the event DNAPL is detected in WS-11-161 Siltronic will follow the overdrilling procedure for

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the WS-14 monitoring well cluster.

- The WS-14 monitoring well cluster will be overdrilled to a minimum depth of 15-feet below the bottom of the filter pack for WS-14-161. The material retrieved from below the bottom of the filter pack will be visually inspected for evidence of DNAPL. Absent visual evidence of DNAPL, sealing of the borehole will proceed. If evidence of DNAPL is observed then the boring will be advanced ten additional feet and the material from the bottom of the borehole will be inspected for evidence of DNAPL. This process should be repeated until no evidence of DNAPL is observed at which time borehole sealing will proceed.
- Consistent with site-specific requirements for preparation and use, organoclay-bentonite sealant will be used throughout the depth intervals where available information (e.g., boring logs, TarGOST® logs, observations made during abandonment work) provides evidence of DNAPL occurrence.
- Use of the organoclay-bentonite mix will be documented in detail. Documentation should include but is not limited to, Siltronic providing the basis for identifying the depth interval(s) where the organoclay-bentonite sealant was used; mud-weight measurements for each volume of slurry mixed and pumped downhole; the total volume of slurry used; and the estimated depth of slurry placement.
- The remaining portions of the borehole should be sealed using materials consistent with the requirements of OAR 690-240-510.
- Well abandonment materials will be characterized and managed consistent with the procedures established for investigation derived waste generated within the TCE Contaminated Material Management Area.
- Siltronic will submit the report documenting abandonment work within 45-days of completing work in the field.

The Revised Abandonment Plan should be revised to include the information indicated above and submitted to DEQ on or before October 6, 2014.

Replacement Monitoring Well Drilling and Installation

DEQ requires that Siltronic drill and install a deep monitoring well in the vicinity of the WS-11 monitoring well cluster to replace the two deep installations being abandoned. The replacement well will be used to monitor groundwater levels and chemistry in the deep Lower Alluvium WBZ beneath the "deep aquitard." The data from the installation will be used to further evaluate water level differences between the upper Lower Alluvium water-bearing zone (WBZ) and deep Lower Alluvium WBZ, and groundwater chemistry in the deep Lower Alluvium WBZ. The monitoring well will also be incorporated into Alluvium WBZ hydraulic control and containment system performance monitoring program.

The replacement monitoring well should be constructed in a separate borehole from the WS-11 double-completion installation. The replacement monitoring well should be drilled to a depth that ensures that the top of the filter pack is below the bottom of the deep aquitard. Before field work begins, Siltronic should submit a work plan for drilling and installing the monitoring well for DEQ's review and approval. The plan should include information regarding the proposed

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Mr. Myron Burr
Siltronic Corporation
September 18, 2014
Page 3 of 3

location, projected depth and basis, drilling methodology, and construction methodology and materials. DEQ requests that Siltronic submit the deep monitoring well drilling and installation plan for our review on or before October 20, 2014.

Please contact me with questions regarding this letter.

Sincerely,

Dana Bayuk

Cc: Alan Gladstone, Davis Rothwell Earle and Xochihua
Bill Earle, Davis Rothwell Earle and Xochihua
Chris Reive, Jordan Ramis
James Peale, MFA
Kerry Gallagher, MFA
Bob Wyatt, NW Natural
Patty Dost, Pearl Legal Group
John Edwards, Anchor QEA, LLC
John Renda, Anchor QEA, LLC
Rob Ede, Hahn & Associates, Inc.
Sean Sheldrake, EPA
Rich Muza, EPA
Lance Peterson, CDM Smith
Scott Coffey, CDM Smith
Kris Byrd, Oregon Water Resources Department
Keith Johnson, NWR/C&SA
Tom Gainer, NWR/C&T
Henning Larsen, NWR/C&T
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Oregon

John A. Kitzhaber, MD, Governor

Department of Environmental Quality

Northwest Region Portland Office

2020 SW 4th Avenue, Suite 400

Portland, OR 97201-4987

(503) 229-5263

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TTY (503) 229-5471

October 22, 2014

Also Sent Via E-mail

Mr. Myron Burr
Siltronic Corporation
7200 Front Avenue, M/S 30
Portland, OR 97210-3676

**Re: Abandonment of the WS-11 and WS-14 Monitoring Well Clusters - Siltronic Corporation Facility
Portland, Oregon
ECSI No. 183**

Dear Mr. Burr:

The Oregon Department of Environmental Quality (DEQ) reviewed the "Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan – Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI 183" dated October 6, 2014 (Final Revised Abandonment Plan). The Final Revised Abandonment Plan presents the approach Siltronic will be using to abandon the WS-11 and WS-14 nested double-completion monitoring well clusters. Maul Foster and Alongi, Inc. (MFA) prepared the Final Revised Abandonment Plan for Siltronic Corporation (Siltronic) based on DEQ's September 18, 2014 comments on the Revised Abandonment Plan¹.

The primary purpose of this letter is to inform Siltronic that based on our review, DEQ:

- Acknowledges the Final Revised Abandonment Plan has been revised consistent with our September 18th comments letter; and
- Approves the Final Revised Abandonment Plan for finalization and implementation subject to the document being revised as follows:
 - The first paragraph summarizes correspondence related to the abandonment of the WS-11 and WS-14 monitoring well clusters. The paragraph is missing a reference to DEQ's April 10, 2014 e-mail: 1) informing Siltronic that the Draft Abandonment Plan² lacked details regarding well abandonment procedures; and 2) approving video logging of the monitoring wells in the WS-14 cluster to support scoping and planning of the abandonment work.
 - The Final Revised Abandonment Plan removes references to the use of 10-inch and 8-inch casing for overdrilling the WS-11 and WS-14 monitoring well clusters. DEQ understands from telephone conversations with MFA that these casing sizes will be used. DEQ further understands that the 10-inch casing will be advanced to a minimum of 5-feet below the bottom of the sand pack at monitoring wells WS-11-125 and WS-14-125. Advancement of the 10-inch casing may continue depending on observations made in the field of the material from this

¹ MFA, 2014, "Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan – Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI 183," July 25, a work plan prepared for Siltronic Corporation.

² MFA, 2014, "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI No. 183," February 14, a work plan prepared on behalf of Siltronic Corporation.

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Myron Burr
Siltronic Corporation
October 22, 2014
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depth. The 8-inch casing will be used to remove well construction materials to the bottom of the borehole consistent with the procedures identified in the abandonment plan. This information should be incorporated into the Final Abandonment Plan.

DEQ requests that Siltronic incorporate the final changes indicated above and submit the Final Abandonment Plan on or before November 7, 2014.

Please don't hesitate to contact me with questions regarding this letter.

Sincerely,

Dana Bayuk
Project Manager
Cleanup and Site Assessment Section

Cc: Alan Gladstone, Davis Rothwell Earle and Xochihua
Bill Earle, Davis Rothwell Earle and Xochihua
Ilene Gaekwad, Davis Rothwell Earle and Xochihua
Chris Reive, Jordan Ramis
James Peale, MFA
Kerry Gallagher, MFA
Bob Wyatt, NW Natural
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ATTACHMENT B

MONITORING WELL COMPLETION LOGS



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Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction		
		Project Number 8128.01.06	Well Number WS-11	Sheet 1 of 11
Project Name	Wacker Siltronic Corporation		TOC Elevation (feet NGVD)	31.8500
Project Location	7200 Northwest Front Avenue, Portland Oregon 97210		Surface Elevation (feet NGVD)	31.9350
Start/End Date	9/21/03 to 10/3/03		Northing	7624628.3
Driller/Equipment	Prosonic Corporation/Rotasonic		Easting	705147.0
Geologist/Engineer	Tony Silva		Hole Depth	207.0-feet
Sample Method	4x6 Core Barrel		Outer Hole Diam	9.0/6.0-inch

Depth (feet, BGS)	Well Details	Sample Data				Blows/6"	Lithologic Column	Soil Description
		Interval	Percent Recovery	Collection Method	Number	Name (Type)		
1			100%	CB		PID = 0.0		0.0 to 0.5 feet: TOPSOIL, GRAVELLY SILT (ML); grayish brown; 20% fines, non plastic; 30% gravel, medium, subangular; 50% organic debris, rootlets, woody debris; moist.
2								0.5 to 1.5 feet: SANDY GRAVEL (GP); brownish-gray; 40% sand, fine to medium; 60% gravel, fine, subangular to subrounded; dry. (Fill)
3						PID = 0.0		1.5 to 7.0 feet: SAND (SP); light brown, 95% sand, medium; 5% gravels, fine to medium, subrounded; moist. (Fill)
4			100%	CB		PID = 0.0		
5								
6								
7			100%	CB		PID = 0.0		7.0 to 12.0 feet: SAND (SP); dark brown; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)
8								
9						PID = 0.0		
10								
11						PID = 0.0		
12								12.0 to 16.0 feet: WOOD; core of wood; staining at upper end of wood; naphthalene or petroleum like odor. (Fill)
13								
14						PID = 0.0		
15								
16			100%	CB				16.0 to 17.0 feet: SAND (SP); dark brown; 100% sand, fine to medium; trace fines and gravels; moist. Possibly chiling stuff from trying to clean out the hole from the wood. (Fill)
17								17.0 to 18.0 feet: WOOD; core of wood; staining at upper end of wood; naphthalene or petroleum like odor. (Fill)
18			100%	CB		PID = 0.0		18.0 to 19.0 feet: SAND (SP); light brown, moist; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)
19								19.0 to 21.0 feet: SANDY SILT (ML-SM); light gray; 50% fines, non plastic; 50% sand, fine to medium; dry. Brittle, breaks apart in flakes. (Fill)
20						PID = 0.0		

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

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Maul Foster & Alongi, Inc.
Geologic Borehole Log/Well Construction

 Project Number
 8128.01.06

 Well Number
 WS-11

 Sheet
 2 of 11

Depth (feet, BOS)	Well Details	Interval	Percent Recovery	Sample Data			Blows/ft	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)			
21						PID = 0.0			21.0 to 27.0 feet: SAND (SP); reddish-brown; 90% sand, fine to medium; 10% gravel, fine to medium, subrounded; dry to moist. (Fill) @ 22.5 feet: 0.2-foot layer color change to light gray. Steel debris, possibly steel shackle from a padlock.
22									
23						PID = 0.0			
24						PID = 0.0			
25						PID = 0.0			
26									
27			90%	CB		PID = 0.0			27.0 to 28.0 feet: NO RECOVERY.
28									28.0 to 31.5 feet: SAND (SP); dark gray; 95% sand, fine to medium; 5% gravels, subrounded; wet. (Fill)
29						PID = 0.0			
30									
31									
32						PID = 13.5			
33						PID = 7.0			31.5 to 37.0 feet: SILTY SAND to SANDY SILT (SM-ML); dark gray; 50% fines, non plastic; 50% sand, fine; organic debris, roots; moist to wet. @ 31.5 feet: 0.2-foot thick layer of staining, sheen. Petroleum like odor.
34									
35						PID = 0.0			
36									
37			90%	CB		PID = 0.0			
38									37.0 to 38.0 feet: NO RECOVERY.
39									38.0 to 41.0 feet: SANDY SILT (ML); dark gray; 60% fines, non plastic; 40% sand, fine; organic debris, wood, roots; wet.
40									
41						PID = 0.0			
42									
43									
44									41.0 to 47.0 feet: SILTY SAND (SM); dark gray; 25% fines, non plastic; 75% sand, fine to medium, organic debris, roots, woody debris; wet. Faint petroleum-like odor.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed
 prior to well development.

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 WATER RESOURCES DEPT
 SALEM, OREGON

GBLWC W\GINTG\TWP\PROJECTS\8128-01\WS-11\3.GPJ 7/2/04

Maul Foster & Alongi, Inc.			Geologic Borehole Log/Well Construction					
			Project Number 8128.01.06			Well Number WS-11		Sheet 3 of 11
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)		
43								
44								
45						PID = 0.0		
46								
47			100%	CB		PID = 0.0		47.0 to 50.0 feet: SILTY SAND (SM); dark gray; 40% fines, non plastic; 60% sand, fine to medium; micaceous; organic debris; wet
48								
49								
50						PID = 0.0		50.0 to 53.5 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet
51								
52						PID = 0.0		
53								
54						PID = 0.0		53.5 to 54.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine; sand in pockets; micaceous; organic debris.
55								54.0 to 57.0 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet
56								
57			100%	CB		PID = 0.0		57.0 to 58.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous; organic debris; wet
58								
59						PID = 0.0		58.0 to 59.0 feet: SILT (ML); dark gray; 100% fines, medium plasticity, trace fine sand in pockets; micaceous; organic debris, roots; wet
60								59.0 to 60.0 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet
61						PID = 0.0		60.0 to 64.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous; organic debris; wet
62			100%	CB		PID = 0.0		
63						PID = 0.0		
64								
65								64.0 to 67.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium; micaceous, coarse mica flakes; wet

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

JAN 23 2015

WATER RESOURCES DEPT
SALEM, OREGON

Maul Foster & Alongi, Inc.			Geologic Borehole Log/Well Construction					
			Project Number 8128.01.06		Well Number WS-11		Sheet 4 of 11	
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Soil Description
					Number	Name (Type)	Blows/ft	
66						PID = 0.0		
67			100%	CB		PID = 0.0		67.0 to 67.5 feet: NO RECOVERY; stiff.
68						PID = 0.0		67.5 to 72.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; organic debris, roots; moist to wet.
69								
70				GW	WS11-W-72.0	PID = 0.0		@ 70.0 feet: 0.2-foot layer of silt with organic debris.
71								
72			80%	CB		PID = 0.0		72.0 to 75.0 feet: NO RECOVERY; stiff.
73								
74								
75								75.0 to 78.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous; wet.
76								
77								
78						PID = 0.0		78.0 to 82.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; wet.
79								
80						PID = 0.0		
81								
82						PID = 0.0		82.0 to 83.0 feet: SILT (ML); dark gray; 95% fines, non plastic; 5% sand, fine, sand in pockets; micaceous; organic debris, roots; moist.
83								83.0 to 84.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; organic debris; wet.
84								84.0 to 85.5 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous; wet.
85				GW	WS11-W-87.0	PID = 0.0		85.5 to 86.0 feet: SILT (ML); dark gray; 85% fines, non plastic; 15% sand, fine, sand in pockets; micaceous; moist.
86								86.0 to 87.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 90% sand, fine; 5% organic debris, woody debris; micaceous; wet.
87			100%	CB		PID = 0.0		87.0 to 87.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; organic debris; roots; moist to wet.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

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WATER RESOURCES DEPT
SALEM, OREGON

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
5 of 11

Depth (feet, bgs)	Well Details	Interval	Percent Recovery	Sample Data			Blows/ft	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)			
88						PID = 0.0			fine, micaceous, wet
89						PID = 0.0			87.5 to 88.0 feet: SILT with SAND (ML); dark gray, 70% fines, non plastic; 30% sand, fine to medium, micaceous, organic debris, moist to wet.
90						PID = 0.0			88.0 to 92.5 feet: SAND (SP); dark gray, 5% fines, non plastic; 95% sand, fine, micaceous, wet.
91						PID = 0.0			
92						PID = 0.0			
93						PID = 0.0			92.5 to 94.5 feet: SILT (ML); dark gray, 90% fines, medium plasticity, 10% sand, fine to medium, sand in pockets; micaceous; organic debris; wet.
94						PID = 0.0			
95						PID = 1.5			94.5 to 98.0 feet: SAND (SP); dark gray, 5% fines, non plastic; 95% sand, fine, micaceous, wet.
96						PID = 1.5			
97						PID = 1.5			
98						PID = 1.5			
99						PID = 1.5			98.0 to 102.0 feet: SAND with SILT (SP-SM); dark gray, 15% fines, non plastic; 85% sand, fine to medium; micaceous, wet. Fines occur in nodules, up to 0.5-inches in diameter.
100						PID = 1.5			
101						PID = 1.5			
102						PID = 1.5			
103						PID = 1.5			
104						PID = 1.5			
105						PID = 1.5			
106						PID = 1.5			
107						PID = 1.5			
108						PID = 1.5			
109						PID = 1.5			
110						PID = 1.5			
111						PID = 1.5			

NOTES: 1. CB = 4.6-inch core barrel soil sampler. 2. PID = Photo Ionization detector; soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed
prior to well development.

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**WATER RESOURCES DEPT
SALEM, OREGON**

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
6 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
111						PID = 3.1			
112									112.0 to 118.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
113						PID = 0.0			
114									
115									
116						WS11-W-117.0 WS11-W-DUP PID = 3.1			@ 116.0 feet: 0.1-foot layer of SILT (ML).
117									
118			100%	CB		PID = 3.1			
119						PID = 6.2			118.0 to 118.5 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; wet. Strong odor, visible sheen on soil.
120									118.5 to 119.5 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium; wet. Faint odor.
121						PID = 0.0			119.5 to 119.7 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
122									119.7 to 120.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium; micaceous; wet.
123									120.0 to 122.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
124						PID = 0.0			122.0 to 123.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium; micaceous; wet.
125						PID = 0.0			123.0 to 127.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
126									
127			100%	CB		PID = 0.0			127.0 to 128.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium, red and green lithics; wet.
128									128.0 to 132.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
129									
130						WS11-W-132.0 PID = 0.0			@ 130.0 feet: 0.3-foot layer of SILT (ML); dark gray; organic debris.
131									
132			100%	CB		PID = 0.0			132.0 to 137.0 feet: SAND (SP); dark gray with white speckles, salt and

NOTES: 1. CB = 4x8-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

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WATER RESOURCES DEPT
SALEM, OREGON

GBLWC W\GINTGINT\PROJECT\SB128-01\WS10-13.GPJ 7/2/04

Maul Foster & Alongi, Inc.			Geologic Borehole Log/Well Construction					
			Project Number 8128.01.06		Well Number WS-11		Sheet 7 of 11	
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)		
133						PID = 0.0		pepper look; 5% fines, non plastic; 95% sand, medium; micaceous; wet
134						PID = 0.0		
135						PID = 0.0		
136						PID = 0.0		
137		70%	CB			PID = 0.0		137.0 to 140.0 feet NO RECOVERY.
138						PID = 0.0		
139						PID = 0.0		
140						PID = 0.0		140.0 to 146.5 feet SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, dark green and red lithics; micaceous; wet
141						PID = 0.0		
142						PID = 0.0		
143						PID = 0.0		
144						PID = 0.0		
145				GW		WS11-W-147.0 PID = 0.0		
146						PID = 0.0		
147		100%	CB			PID = 0.0		146.5 to 147.0 feet SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium, sand in pockets; micaceous; wet
148						PID = 0.0		147.0 to 150.0 feet SAND (SP); dark gray; 5% fines, non plastic; 95% sand, medium, dark green and red lithics; micaceous; wet
149						PID = 0.0		
150						PID = 0.0		150.0 to 152.0 feet SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium, sand in pockets; micaceous; organic debris; wet
151						PID = 0.0		
152						PID = 0.0		152.0 to 153.0 feet SAND (SP); dark gray; 5% fines, non plastic; 95% sand, medium, dark green and red lithics; micaceous; wet
153						PID = 0.0		153.0 to 153.5 feet SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium, sand in pockets; micaceous; organic debris; wet
154						PID = 0.0		153.5 to 157 feet SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium, red and green lithics; organic debris; wet. Fines occur in chunks or balls.
155						PID = 0.0		

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo Ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

JAN 23 2015

WATER RESOURCES DEPT
SALEM, OREGON

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
8 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/ft		
156						PID = 0.0			
157			100%	CB		PID = 0.0			@ 157.0 feet: 0.2-foot layer of SILT (ML). 157.2 to 160.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
158						PID = 0.0			
159						PID = 0.0			
160						PID = 0.0			160.0 to 161.0 feet: SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium; wet.
161						PID = 0.0			161.0 to 164.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
162						PID = 0.0			@ 162.0 feet: 0.3-foot layer of SILT (ML).
163						PID = 0.0			@ 162.8 feet: 0.3-foot layer of SILT (ML).
164						PID = 0.0			164.0 to 165.0 feet: SILT (ML); dark gray to greenish-gray; 90% fines, low to medium plasticity; 10% sand, fine, sand in pockets, organic debris; wet.
165				GW		WS11-W-167.0 PID = 0.0			165.0 to 165.5 feet: SANDY SILT (ML); dark gray to greenish gray; 60% fines, non plastic; 40% sand, fine; wet.
166						PID = 0.0			165.5 to 167.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
167			80%	CB		PID = 0.0			167.0 to 169.0 feet: NO RECOVERY.
168						PID = 0.0			
169						PID = 0.0			169.0 to 170.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine, green and red lithics; wet.
170						PID = 0.0			170.5 to 171 feet: SILTY SAND (SM); dark gray; 20% fines, low plasticity; 80% sand, fine; wet.
171						PID = 0.0			171.0 to 174.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, dark green and red lithics; wet.
172						PID = 0.0			
173						PID = 0.0			
174						PID = 0.0			174.0 to 174.5 feet: SILT (ML); dark gray to greenish-gray; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; wet.
175						PID = 0.0			174.5 to 179.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium, green and red lithics; wet.
176						PID = 0.0			
177			100%	CB		PID = 0.0			

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample. 4. Screen graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

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WATER RESOURCES DEPT
SALEM, OREGON

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
9 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)		
178		100%	CB	GW	WS11-W-182.0	PID = 0.0		179.0 to 182.0 feet SAND (SP); dark gray with white speckles, salt and pepper look; 100% sand, medium, green and red lithics; wet
179						PID = 0.0		
180						PID = 0.0		
181						PID = 0.0		
182						PID = 0.0		
183						PID = 0.0		
184						PID = 0.0		
185						PID = 0.0		
186						PID = 0.0		
187						PID = 0.0		
188		90%	CB	GW	WS11-W-197.0	PID = 0.0		182.0 to 187.0 feet SAND (SP); dark gray, 5% fines, non plastic; 95% sand, fine, red lithics; wet.
189						PID = 0.0		
190						PID = 0.0		
191						PID = 0.0		
192						PID = 0.0		
193						PID = 0.0		
194						PID = 0.0		
195						PID = 0.0		
196						PID = 0.0		
197						PID = 0.0		
198		40%	CB	GW	WS11-W-197.0	PID = 0.0		187.0 to 188.0 feet NO RECOVERY.
199						PID = 0.0		
200						PID = 0.0		
						PID = 0.0		
						PID = 0.0		
						PID = 0.0		
						PID = 0.0		
						PID = 0.0		
						PID = 0.0		
						PID = 0.0		
195.0 to 195.5 feet		40%	CB	GW	WS11-W-197.0	PID = 0.0		195.0 to 195.5 feet SILT (ML); dark gray to greenish-gray; 95% fines, low plasticity; 5% sand, fine, sand in pockets; organic debris, roots, leaves; wet.
195.5 to 201.0 feet								195.5 to 201.0 feet SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red lithics; wet.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = ground water sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

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SALEM, OREGON

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
10 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/ft		
201				GW		PID = 0.0			201.0 to 204.5 feet: SILTY GRAVEL (GM); dark gray, 15% fines, non plastic; 85% gravel, fine to coarse, subrounded to rounded; wet.
202						PID = 0.0			
203									204.5 to 207.0 feet: BASALT; light gray to dark gray; moist to wet; bedrock (Columbia River Basalt Group) Significant increase in resistance, drilling hardness.
204						WS11-206.0			
205									
206									
207									

Total Depth = 207.0 feet below ground surface.

WS11 Completion Details

Oregon Water Resources Department Well Start Card Number: W147655
Oregon Water Resources Department Well Identification Number: L67076

Boring:


0.0 to 58.0 feet bgs: 9-inch temporary, threaded steel, isolation casing.
0.0 to 137.0 feet bgs: 8-inch temporary, threaded steel, isolation casing.
0.0 to 58.0 feet bgs: 7-inch temporary, threaded steel, isolation casing.
0.0 to 207.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
0.0 to 207.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.5 feet bgs: flush mount vault and cement seal.
1.5 to 5.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
5.0 to 102.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
102.0 to 104.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
106.0 to 124.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
124.0 to 126.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
126.0 to 139.0 feet bgs: bentonite grout slurry, 10.3 pounds per gallon.
139.0 to 140.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
161.0 to 207.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.

Well WS11-125:

0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

 Approximate water level observed prior to well development.

JAN 23 2015

WATER RESOURCES DEPT
SALEM, OREGON

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
11 of 11

Depth (feet, BGS)	Well Details	Sample Data				Soil Description		
		Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/ft	Lithologic Column

Well WS11-161:

0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.

145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.

160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

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NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

JAN 23 2015

Approximate water level observed
prior to well development.

**WATER RESOURCES DEPT
SALEM, OREGON**

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
1 of 11

Project Name: Siltronic Corporation
Project Location: 7200 NW Front Avenue Portland, Oregon
Start/End Date: 6/22/2004 to 7/9/2004
Driller/Equipment: Boart Longyear/Rotosonic
Geologist/Engineer: ABC/EB
Sample Method: 4x6-inch core barrel.

TOC Elevation (feet)
Surface Elevation (feet): 32.4
Northing: 705183.4
Easting: 7624486.1
Hole Depth: 210.0-feet
Outer Hole Diam: 10.0 to 6.0-inch

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)				
1			100	CB						0.0 to 1.3 feet: GRAVELLY SILT (ML); dark yellowish-brown; 70% fines, non plastic; 30% gravels, fine, subangular; trace organic debris; dry.
2						PID = 0ppm.				1.3 to 10.0 feet: SILTY SAND (SM); dark gray; 40-50% fines, low plasticity; 50-60% sand, fine; damp.
3										
4			80%	CB						@ 5.0-feet: Increased fines to 50%.
5						PID = 0ppm.				
6			95%	CB						
7										@ 9.5-feet: slight odor.
8						PID = 0ppm.				10.0 to 11.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; no noticeable odor; damp.
9										
10										11.0 to 14.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; trace gravels, fine to coarse; trace organic debris; slight odor; tarr-like balls; damp.
11			100	CB						
12										
13						PID = 0ppm.				14.0 to 16.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; trace organic debris; no noticeable odor; damp.
14										
15										16.0 to 18.5 feet: GRAVELLY SAND (SP); light grayish-brown; 70% sand, fine; 30% gravels, fine to medium, subangular; trace fines; damp.
16			100	CB		PID = 0ppm.				
17										
18										
19						PID = 0ppm.				18.5 to 22.0 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.
20										

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo Ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed plastic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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SALEM, OREGON

Maul Foster & Alongi, Inc.
Geologic Borehole Log/Well Construction

 Project Number
 8128.01.08

 Well Number
 WS-14

 Sheet
 2 of 11

Depth (feet, BGS)	Well Details	Interval Percent Recovery	Sample Data			Blows/6"	Lithologic Column	Soil Description
			Collection Method	Number	Name (Type)			
21		100	CB					
22					PID = 0ppm.			22.0 to 22.5 feet: SILT (ML); light brownish-gray; 85% fines, low plasticity; 15% sand, fine; trace gravels, fine to medium, subrounded; trace organic debris; trace woody debris; damp.
23								22.5 to 23.5 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.
24		100	CB					23.5 to 26.0 feet: GRAVELLY SILT (ML); light grayish-brown; 65% fines, medium plasticity; 35% gravels, fine to coarse, subangular; trace sand; moist.
25					PID = 0ppm.			
26		100	CB					26.0 to 29.0 feet: GRAVELLY SILT (ML); dark brownish-gray; 65% fines, medium plasticity; 35% gravels, fine to coarse, subangular; trace sand; strong sheen and odor; possible product; moist.
27								
28					PID = 29.7ppm.			
29								29.0 to 33.0 feet: SANDY SILT (ML); dark brownish gray; 65% fines, low plasticity; 35% sand, fine; heavy sheen and odor; tarry-like impacts; possible product; moist.
30								
31		100	CB		PID = 8.1ppm.			
32								
33					PID = 0ppm.			33.0 to 35.0 feet: SILTY SAND (SM); dark grayish-brown; 40% fines, low plasticity; 60% sand, fine; subrounded clast approximately 5-inches in diameter; heavy sheen and odor; moist.
34								
35					PID = 0ppm.			35.0 to 35.5 feet: SAND (SP); light yellowish-brown; 100% sand, fine; trace fines, non plastic; heavy sheen and odor; moist.
36		90	CB					35.5 to 38.5 feet: SAND (SP); dark brownish-gray; 100% sand, fine; trace fines, non plastic; heavy sheen and odor; globules; moist to wet.
37								
38					PID = 0ppm.			
39								38.5 to 52.5 feet: SILTY SAND (SM); dark brownish-gray; 25% fines, non to low plasticity; 75% sand, fine; trace gravels, subangular; strong odor; wet.
40								
41		100	CB		PID = 8ppm.			
42								

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NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
3 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Blows/ft	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)			
43									
44						PID = 0ppm.			
45									
46									
47						PID = 0ppm.			
48									
49									
50						PID = 0ppm.			
51									
52									
53						PID = 0ppm.			52.5 to 53.0 feet: SILT (ML); dark brownish-gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist to wet.
54									53.0 to 55.5 feet: SILTY SAND (SM); dark brownish-gray; 25% fines, non to low plasticity; 75% sand, fine; trace gravels, subangular; strong odor; wet.
55									
56		100		CB		PID = 0ppm.			55.5 to 56.0 feet: SILT (ML); dark brownish-gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist to wet.
57									56.0 to 58.0 feet: SAND WITH SILT (SP-SM); dark brownish-gray; 15% fines, non plastic; 85% sand, fine; strong odor; wet.
58									
59						PID = 0ppm.			58.0 to 66.0 feet: SILTY SAND (SM); dark brownish-gray; 15 to 20% fines, non to low plasticity; 75 to 80% sand, fine; trace cobbles, subrounded; strong odor; wet.
60									@ 60.0 feet: 3-inch silt layer.
61		90		CB					
62						PID = 0ppm.			
63									
64									@ 63.5.0 feet: odor becoming slight.
65									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo Ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, depth graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.
Geologic Borehole Log/Well Construction

 Project Number
 8128.01.08

 Well Number
 WS-14

 Sheet
 4 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Blows/ft	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)			
66						PID = 0ppm.			
67		100		CB					66.0 to 67.0 feet: SANDY SILT (ML); dark grayish-brown; 80% fines, non to low plasticity; 20% sand, fine; micaceous; moderate odor; moist to wet.
68						PID = 0ppm.			67.0 to 69.5 feet: SAND (SP); dark grayish-brown; 5% fines, non plastic; 95% sand, fine; micaceous; no noticeable odor; moist to wet.
69									@ 68.0 feet: 2-inch silt layer.
70									69.5 to 70.0 feet: SILT (ML); dark gray; 85% fines, low plasticity; 15% sand, fine; moist.
71		0		CB		PID = 0ppm. WS14-W-71			70.0 to 71.0 feet: SAND (SP); dark grayish-brown; 5% fines, non plastic; 95% sand, fine; micaceous; moist to wet.
72									71.0 to 75.5 feet: NO RECOVERY.
73									
74									
75									
76		100		CB		PID = 9.4ppm.			75.5 to 81.5 feet: SAND (SP); dark brownish-gray; trace to 5% fines, non plastic; 95 to 100% sand, fine; micaceous; slight odor; wet.
77									
78		100		CB		PID = 0ppm.			
79									@ 79.0 feet: trace silty balls.
80									
81						PID = 0ppm.			
82									81.5 to 82.5 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; slight odor; wet.
83									82.5 to 83.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; moderate odor; wet.
84						PID = 0ppm.			83.5 to 84.3 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; slight odor; wet.
85									84.3 to 84.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; moderate odor; wet.
86						WS14-W-86			84.5 to 85.0 feet: SAND and SILT (SP-ML); dark gray; approximately 1/4-inch to 1/2-inch sand and silt layers; wet.
87						PID = 0ppm.			85.0 to 87.5 feet: SAND (SP); dark gray; 10% fines, non plastic; 90% sand, fine; micaceous; odor; wet.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GWS = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction							
		Project Number 8128.01.08		Well Number WS-14		Sheet 5 of 11			
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Blows/6"	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)			
88		100	CB						87.5 to 88.0 feet: SANDY SILT (ML); gray; 60% fines, low to medium plasticity; 40% sand, fine; micaceous; moderate odor; wet.
89									88.0 to 89.5 feet: SILTY SAND (SM); gray; 15% fines, non plastic; 85% sand, fine; micaceous; slight odor; wet.
90						PID = 13ppm.			89.5 to 90.5 feet: SILT (ML); dark gray; 100% fines, medium plasticity; trace sand, fine; micaceous; moist.
91									90.5 to 92.0 feet: SILTY SAND (SM); gray; 15% fines, non plastic; 85% sand, fine; micaceous; sheen and strong odor; wet.
92									92.0 to 96.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand, fine; micaceous; sheen and strong odor; moist. Several zones of 2-inch pockets with fine sand.
93						PID = 28.3ppm.			
94									
95									
96		100	CB			PID = 0ppm.			96.0 to 98.0 feet: SANDY SILT (ML); dark gray; 85% fines, medium plasticity; 15% sand, fine; micaceous; strong odor; moist.
97									
98									98.0 to 102.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; strong odor; wet. Between 99.0 and 99.5 feet several 1/2-inch silt bands intermixed with sand.
99						PID = 0ppm.			
100									@ 100.5 feet: 1-inch silt layer.
101						WS14-W-101			
102		100	CB			PID = 0ppm.			102.0 to 105.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; sheen and strong odor; wet.
103									
104									
105						PID = 84ppm.			105.0 to 105.5 feet: SILT (ML); gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist.
106									105.5 to 106.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; sheen and strong odor; wet.
107									106.0 to 108.0 feet: SILT (ML); gray; 100% fines; low plasticity; trace sand, fine; trace rootlets; moderate odor; moist.
108									@ 107.0 feet: 2-inch gray sand layer with strong odor.
109						PID = 9.5ppm.			108.0 to 108.5 feet: SILTY SAND (SM); gray; 30% fines, low plasticity; 70% sand, fine; sheen and strong odor; wet.
110									108.5 to 110.5 feet: SILT (ML); gray; 100% fines; low plasticity; trace sand, fine; sheen and strong odor; moist.
									@ 109.0 feet: 4-inch silty sand layer with sheen and strong odor.

NOTES:

1. CB = 4x6-inch core barrel soil sampler.

2. PID = Photo ionization detector, soil head space reading in parts per million.

3. GW = groundwater sample, dashed graphic indicates approximate screened interval.

4. bgs = below ground surface.

5. PVC = poly vinyl chloride.

6. Odor characteristic of non-hydrocarbon waste.

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Maul Foster & Alongi, Inc.			Geologic Borehole Log/Well Construction						
			Project Number 8128.01.08		Well Number WS-14		Sheet 6 of 11		
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data		Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)			
111		100	CB		PID = 0ppm.				110.5 to 111.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; slight odor; wet 111.0 to 113.0 feet: NO RECOVERY; silt.
112									
113					PID = 0ppm.				113.0 to 114.0 feet: SANDY SILT (ML); dark brownish-gray; 60% fines, non to low plasticity; 40% sand, fine; micaceous; faint odor; moist to wet.
114									114.0 to 120.5 feet: SAND (SP); dark brownish-gray; 5% fines, non plastic; 95% sand, fine; micaceous; no noticeable odor; wet.
115									
116					PID = 0ppm.				@ 116.0 feet: 3-inch silt layer.
117									
118									
119					PID = 0ppm.				
120					WS14-W-120				
121		100	CB						120.5 to 121.0 feet: SILT (ML); dark brownish-gray; 85% fines, low plasticity; 15% sand, fine; micaceous; moist.
122									121.0 to 132.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.
123									
124					PID = 0ppm.				@ 124 feet: sheen and strong odor present.
125									
126									
127					PID = 0ppm.				
128									
129									
130					PID = 0ppm.				@ 130 feet: sheen and strong odor fading.
131									
132									


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SALEM, OREGON

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo Ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction									
Maul Foster & Alongi, Inc.					Project Number 8128.01.08		Well Number WS-14		Sheet 7 of 11
Depth (feet, BGS)	Well Details		Sample Data				Lithologic Column	Soil Description	
	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"			
133		0	CB		PID = 0ppm.		132.5 to 133.5 feet: SILT (ML); dark grayish-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.		
134							133.5 to 134.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.		
135							134.0 to 134.5 feet: SILT (ML); dark grayish-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.		
136							134.5 to 136.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet. @ 135.5 feet: 3-inch silt layer.		
137							136.0 to 138.5 feet: NO RECOVERY.		
138									
139		100	CB		PID = 0ppm.		138.5 to 141.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; slight odor; wet.		
140									
141									
142		100	CB		PID = 0ppm. WS14-W-142		141.5 to 142.0 feet: SILT (ML); dark brownish-gray; 85% fines, low plasticity; 15% sand, fine; micaceous; moist. @ 141.7 feet: 1-inch sand layer.		
143							142.0 to 143.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.		
144							143.0 to 145.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand; moist. @ 143.5 feet: 3-inch sand layer.		
145					PID = 0ppm.		145.0 to 148.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; intermixed with 1-inch to 2-inch sand layers; moist.		
146									
147									
148									
149					PID = 0ppm.		148.5 to 149.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.		
150		100	CB		WS14-W-150		149.0 to 149.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand; moist. 149.5 to 150.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.		
151							150.0 to 167.0 feet: SAND (SP); gray; 5% fines, non plastic; 95% sand, fine to medium; trace wood debris; wet.		
152					PID = 0ppm.		@ 152.0 feet: 2-inch silt layer.		
153									
154									
155									

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NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.			Geologic Borehole Log/Well Construction					
			Project Number 8128.01.08		Well Number WS-14		Sheet 8 of 11	
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Soil Description
					Number	Name (Type)	Blows/6"	
156					PID = 0ppm.			@ 155.0 feet: Wood fragments.
157								@ 157.0 feet: 3-inch silt layer.
158					PID = 0ppm.			
159								
160								
161					PID = 0ppm.			
162								
163								
164					PID = 0ppm.			
165								
166								
167		100	CB		PID = 0ppm. WS14-W-167			167.0 to 167.5 feet: NO RECOVERY; silt.
168								167.5 to 169.5 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet
169								
170					PID = 0ppm.			169.5 to 172.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; increasing fines to 15%; wet
171								
172								172.0 to 173.0 feet: SILTY SAND (SM); gray; 35% fines, non plastic; 65% sand, fine; wet
173					PID = 0ppm.			173.0 to 182.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet
174								
175								
176					PID = 0ppm.			
177		100	CB					

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Maul Foster & Alongi, Inc.				Geologic Borehole Log/Well Construction					
				Project Number 8128.01.08		Well Number WS-14		Sheet 9 of 11	
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Blows/6"	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)			
178									
179						PID = 0ppm.			
180									
181									
182		80	CB			PID = 0ppm. WS14-W-182			182.0 to 185.5 feet: NO RECOVERY; sluff.
183									
184									
185									
186						PID = 0ppm.			185.5 to 186.5 feet: SAND (SP); gray; 100 % sand, fine, micaceous; trace fines; wet.
187									186.5 to 188.0 feet: SILTY SAND (SM); gray; 35% fines, low plasticity; 65% sand, fine; wet.
188									188.0 to 190.0 feet: SILT (ML); gray; 100% fines, low to medium plasticity; damp.
189						PID = 0ppm.			@ 189.0 feet: 2-inch fine, sand layer.
190									190.0 to 195.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
191									
192		100	CB			PID = 0ppm.			
193									
194									
195						PID = 0ppm.			195.0 to 196.0 feet: SILTY SAND (SM); gray; 50% fines, low plasticity; 50% sand, fine; wet.
196									196.0 to 197.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
197		90	CB			WS14-W-197			197.0 to 198.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; damp.
198						PID = 0ppm.			198.0 to 204.0 feet: SAND (SP); gray; 100% sand, fine to medium; micaceous; trace fines; wet.
199									
200									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.				Geologic Borehole Log/Well Construction				
				Project Number 8128.01.08		Well Number WS-14		Sheet 10 of 11
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Soil Description
					Number	Name (Type)	Blows/ft	
201						PID = 0ppm.		
202								
203								
204						PID = 0ppm.		204.0 to 208.0 feet: GRAVEL with SILT (GW-GM); gray; 15% fines, non plastic; 85% gravels, fine to coarse, subangular to subrounded; wet.
205								
206								
207								
208						WS14-W-208		208.0 to 210.0 feet: BASALT; light gray to dark gray; moist to wet; bedrock. (Columbia River Basalt Group) Significant increase in resistance, drilling hardness.
209								
210								
Total Depth = 210.0 feet.								
<p>WS14 Completion Details</p> <p>Oregon Water Resources Department Well Start Card Number: 164731 Oregon Water Resources Department Well Identification Number: L67967</p> <p><u>Boring:</u> 0.0 to 69.0 feet bgs: 10-inch temporary, threaded steel, isolation casing. 0.0 to 110.0 feet bgs: 9-inch temporary, threaded steel, isolation casing. 0.0 to 135.0 feet bgs: 8-inch temporary, threaded steel, isolation casing. 0.0 to 210.0 feet bgs: 6-inch temporary, threaded steel, isolation casing. 0.0 to 210.0 feet bgs: 4x6-inch core barrel sampler.</p> <p>0.0 to 1.5 feet bgs: flush mount vault and cement seal. 1.5 to 7.0 feet bgs: 1/4-inch Baroid bentonite chips hydrated with potable water. 7.0 to 104.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon. 104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack. 106.0 to 125.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack. 125.0 to 140.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water. 140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack. 142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack. 161.0 to 210.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.</p>								
<p>NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. BVI = ground water sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristics of manufactured gas plant waste.</p>								

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Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
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Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)				

Well WS14-125:

0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.

109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.

124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

Well WS14-161:

0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.

145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.

160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

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SALEM, OREGON**

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

ATTACHMENT C

OWRD WELL LOGS



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SALEM, OREGON

MULT 72126
MULT 72126
Page 452
11# L67
Start Card # 11/14

Start Card # W147655

(6) LOCATION OF WELL By legal description
Well Location: County Multnomah
Township 1N (N or S) Range 1W (E or W) Section 13
1. SW 1/4 of SW 1/4 of above section.
2. Either Street address of well location, 2200 NW
Front Ave Portland Or.
or Tax lot number of well location 1200
3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include
approximate scale and north arrow.

(7) STATIC WATER LEVEL:
22.4 Ft. below land surface. Date 10-20-03
Artesian Pressure _____ lb/sq. in. Date _____

(8) WATER BEARING ZONES:

Depth at which water was first found _____

From	To	Est. Flow Rate	SWL
109	124	7.0	226

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JUL 06 2004

[illegible]

(unbonded) Monitor Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number 10192

Date

(banded) Monitor Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number 10546
Date 2/10/14
Signature [Signature]
SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

JAN 23 2015

WATER RESOURCES DEPT
SALEM, OREGON

Willamette River

MULT 72126
MULT 72126

Security Gate

Parking Lot #1

Parking Lot #2

Security Gate

I.D. L67076 I.D. L67100

WS 11 WS 12

I.D. L67091

WS 13

WS 10
ID L64996

Hydrogen tank

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WATER RESOURCES DEPT
SALEM, OREGON



MULT 72126



Oregon

Theodore R. Kulongoski, Governor

Water Resources Department

Commerce Building
158 12th Street NE
Salem, OR 97301-4172
503-378-3739
FAX 503-378-8130

September 2, 2003

MARK KNOLLE #10437
C/O PROSONIC CORP
305 E. COMSTOCK DR
CHANDLER AZ 85225

FINAL ORDER

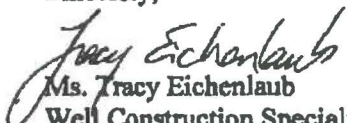
Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card numbers 147653-147655 is approved for the following: multiple completion wells, the wells will have two (2) 2 inch wells in each borehole. See Oregon Administrative Rule (OAR) 690-240-0410(5). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 378-8455 ext 283, or by e-mail at tracy.l.eichenlaub@wrdd.state.or.us.

Sincerely,


Ms. Tracy Eichenlaub
Well Construction Specialist
Enforcement Section

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137.004-0080 and OAR 690-01-0005 you may either petition for judicial review or petition the Director for reconsideration of this order.

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SALEM, OREGON**

MULT 72126



Water Resources Department
Commerce Building
158 12th Street NE
Salem, OR 97301-4172
503-378-3739
FAX 503-378-8130

October 6, 2003

MARK KNOLLE #10437
C/O PROSONIC CORP
305 E. COMSTOCK DR
CHANDLER AZ 85225

FINAL ORDER

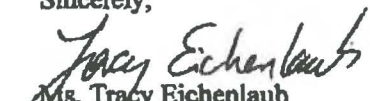
Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card number 147655 is approved for the following: use of bentonite below 50 feet and through more than 25 feet of water, 3/8 inch bentonite pellets will be used to abandon the bottom of the hole from 206 feet to 160 feet. See Oregon Administrative Rule (OAR) 690-240-0475(3). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 986-0851, or by e-mail at tracy.l.eichenlaub@wrdd.state.or.us.

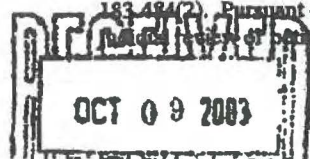
Sincerely,


Ms. Tracy Eichenlaub
Well Construction Specialist
Enforcement Section

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137.004-0080 and OAR 690-01-0005 you may either petition for judicial review or petition the Director for reconsideration of this order.



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WATER RESOURCES DEPT
SALEM, OREGON

STATE OF OREGON
MONITORING WELL REPORT
(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

L 10967 73526
Start Card # 109731

(1) OWNER/PROJECT: WELL NO. WS-13
Name Silfronic Corporation
Address 7200 NW Front Ave
City Portland State OR Zip 97210

(2) TYPE OF WORK:
☒ New construction ☐ Alteration (Repair/Recondition)
☐ Conversion ☐ Deepening ☐ Abandonment

(3) DRILLING METHOD
☐ Rotary Air ☐ Rotary Mud ☐ Cable
☐ Hollow Stem Auger ☒ Other SONIC

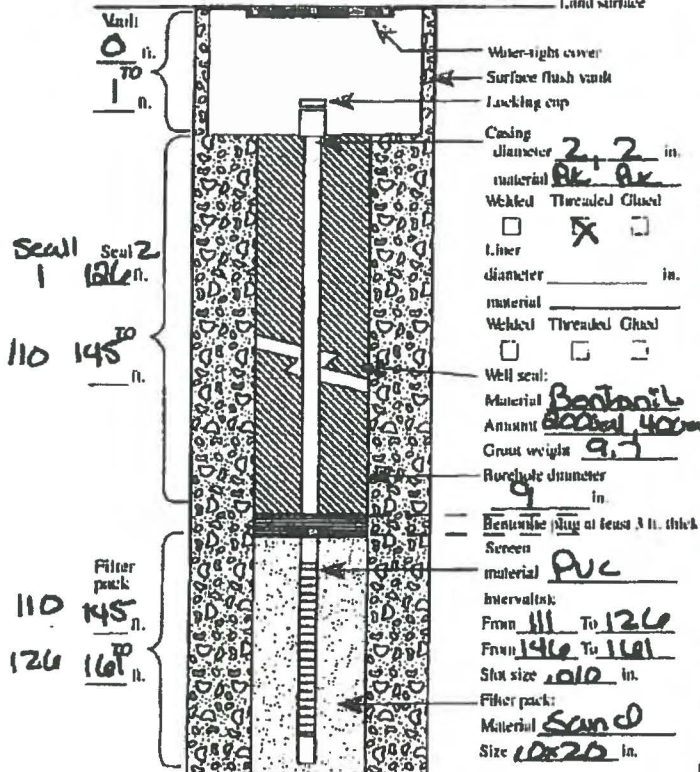
(6) LOCATION OF WELL By legal description
Well Location: County Multnomah
Township 1 (N or S) Range 1 (E or W) Section 13
1. NW 1/4 NW 1/4 of above section.
2. Either: Street address of well location 7200 NW Front Ave
or Tax lot number of well location 1200

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL:
NOT OBSERVED
Artesian Pressure _____ ft. in. Date _____

(4) BORE HOLE CONSTRUCTION

Special Standards ☒ No ☐ Depth of completed well 161 ft. Land surface



(8) WATER BEARING ZONES:

Depth at which water was first found

From	To	Est. Flow Rate	SWL
NOT OBSERVED			

(9) WELL LOG: Ground elevation _____

Material	From	To	SWL
Sand Gravel	0	40	
Seal	40	204	
Basalt	204		
Naked Well Special Standard Request on File			
Drilled well to 204' back-filled with bentonite from 204' to 161'			
Bentonite	161	204	
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AUG 09 2004			
WATER RESOURCES DEPT SALEM, OREGON			

Date started 10/5/04 Completed 7/8/07

(5) WELL TEST:

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
Permeability _____ Yield _____ GPM
Conductivity _____ PH _____
Temperature of water _____ Depth artesian flow found _____ ft.
Was water analysis done? ☒ No ☐ Yes
By whom? ADOT
Depth of strata to be analyzed _____ ft.
Remarks: OBSERVED

Name of supervising Geologist/Engineer _____

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

Signed Li-electric MWC Number 10570
Date 7/21/07

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

Signed Li-electric MWC Number 10570
Date 7/21/07

SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

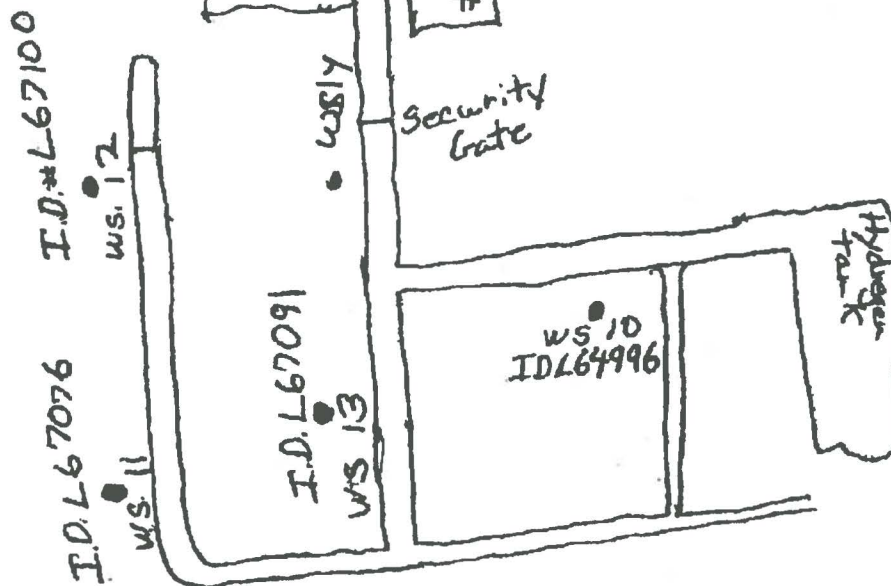
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SALEM, OREGON

Willamette River

MULT 73686



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SALEM, OREGON

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SALEM, OREGON

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INSTRUCTOR THIRD COPY CUSTOMER Date JAN 23 2015

WATER RESOURCES DEPT
SALEM, OREGON

Kerry Gallagher

From: BAYUK Dana <BAYUK.Dana@deq.state.or.us>
Sent: Tuesday, January 28, 2014 9:19 AM
To: James Peale
Cc: Burr, Myron; Gladstone, Alan; Church, Brian (BCHURCH@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); Earle, William G. (WEARLE@davisrothwell.com); Kerry Gallagher; BYRD Kristopher R; LARSEN Henning
Subject: RE: Siltronic - Conversation Confirmation

Good morning James.

This e-mail confirms that during our telephone conversation yesterday I informed you that Siltronic Corporation should prepare a plan for abandoning monitoring well WS-14-161. The screen and sand pack interval of this monitoring well penetrates through the "deep aquitard" identified beneath the Siltronic property. The appearance of dense-non aqueous phase liquid (DNAPL) in the monitoring well indicates the installation is acting as a pathway for contamination to migrate vertically downward through the deep aquitard into deeper intervals of the Alluvium water-bearing zone.

As I indicated during yesterday's call, based on the information summarized above DEQ has determined that abandonment of WS-14-161 is required under the TCE Order (DEQ No. VC-NWR-03-16). Abandonment of WS-14-161 should be conducted consistent with OAR-690-240 and previously approved protocols for abandoning monitoring wells at the Gasco and Siltronic sites (e.g., use of organoclay-bentonite sealant).

Previous work at the adjoining Gasco Site identified potential causes for DNAPL to appear in monitoring wells including: 1) migration of DNAPL to the monitoring well location; and/or 2) vertical migration of DNAPL down the borehole due to failure of the monitoring well seal. Siltronic should assess the cause of DNAPL appearance in WS-14-161 by videoing the inside of the 2-inch monitoring well casing and screen prior to abandonment and, to the extent practicable documenting visual evidence of the depth of DNAPL occurrence during abandonment.

As indicated in your e-mail, Siltronic should submit the abandonment plan for WS-14-161 on or before February 14, 2014.

Please don't hesitate to contact me with questions regarding this e-mail.

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201
E-mail: bayuk.dana@deq.state.or.us
Phone: 503-229-5543
FAX: 503-229-6899

Please visit our website at <http://www.oregon.gov/DEQ/>



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From: James Peale [<mailto:jpeale@maulfoster.com>]
Sent: Monday, January 27, 2014 4:50 PM
To: BAYUK Dana
Cc: Burr, Myron; Gladstone, Alan; Church, Brian (BCHURCH@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); Earle, William G. (WEARLE@davisrothwell.com); Kerry Gallagher
Subject: Siltronic - Conversation Confirmation

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WATER RESOURCES DEPT
SALEM, OREGON

Dana –

This email is provided as a continuation to our conversation of this morning. For the purposes of documentation, Siltronic requires DEQ's email confirmation that DEQ has directed Siltronic to submit a workplan for the abandonment of nested wells WS-14-125 and WS-14-161. The workplan is due February 14, 2014. Please also confirm that the workplan should describe abandonment consistent with WRD regulations (e.g., OAR 690-220 Abandonment of Wells).

MFA is prepared to submit the workplan consistent with these requirements. Please note that if the workplan is approved, Siltronic will require written direction from DEQ in order to proceed with the abandonment.

Thanks in advance, Dana.

jp

JAMES G.D. PEALE RG, LHG | MAUL FOSTER ALONGI

d. 503 501 5218 | p. 971 544 2139 | c. 503 449 9576 | f. 971 544 2140 | www.moulfoster.com

2001 NW 19th Avenue, Suite 200, Portland, OR 97209

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**WATER RESOURCES DEPT
SALEM, OREGON**

From: BAYUK Dana
To: Kerry Gallagher
Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake, Sean (epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorage.com); Carl Stivers (cstivers@anchorage.com); riw@nwnatural.com; Rob Ede (robe@hahnenv.com); BYRD Kristopher R; GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP
Date: Thursday, April 10, 2014 5:42:12 PM

Good afternoon Kerry.

DEQ reviewed the "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, Portland, OR - ECSI No. 183" dated February 14, 2014 (Abandonment Plan). As we discussed by telephone the Abandonment Plan provides insufficient information regarding decommissioning procedures, particularly with respect to over-drilling and removing monitoring well construction materials.

As requested by DEQ, the Abandonment Plan includes a task to video log the WS-14-125/161 monitoring wells before they are decommissioned. During telephone discussions we concluded the video log could provide useful information for developing the approach to decommissioning the two installations. Based on this conclusion, DEQ verbally approved Siltronic moving forward with video logging. This e-mail provides DEQ's written approval for Siltronic to proceed with the video logs of WS-14-125/161.

DEQ understands video logging will be conducted on April 11, 2014. DEQ requests that three copies of the log be provided on disc for our information and use. This e-mail also acknowledges that you notified me of the work and schedule during our phone discussion on April 3rd.

Please feel free to contact me with questions regarding this e-mail.

Dana

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201
E-mail: bayuk.dana@deq.state.or.us
Phone: 503-229-5543
FAX: 503-229-6899

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From: Kerry Gallagher [<mailto:kgallagher@maulfoster.com>]

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**WATER RESOURCES DEPT
SALEM, OREGON**

Sent: Friday, February 14, 2014 3:58 PM

To: BAYUK Dana

Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sea@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorqea.com); Carl Stivers (cstivers@anchorqea.com); rjw@nwnatural.com; Rob Ede (robe@hahnnv.com); GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: Siltronic: Monitoring Well WS-14 Abandonment WP

Dana,

As requested, please find the attached Monitoring Well WS-14 Abandonment Work Plan for your review and approval. The required hard copies of this submittal will follow by mail.

Please call or email if you have any questions. Thank you,

KERRY-CATHLIN GALLAGHER | MAUL FOSTER & ALONGI, INC.

direct. 503 501 5229 | main office. 971 544 2139 | cell. 503 896 0255 | fax. 971 544 2140 | www.maulfooster.com
2001 NW 19th Avenue, Suite 200, Portland, Oregon 97209

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**WATER RESOURCES DEPT
SALEM, OREGON**

Kerry Gallagher

From: BAYUK Dana <BAYUK.Dana@deq.state.or.us>
Sent: Wednesday, June 25, 2014 4:38 PM
To: 'Burr, Myron (Myron.Burr@siltronic.com)'
Cc: 'Gladstone, Alan (AGLADSTONE@davisrothwell.com)'; James Peale; Kerry Gallagher; Bob Wyatt; Patty Dost; 'John Edwards (jedwards@anchorage.com)'; 'Ben Hung'; John Renda; Rob Ede; 'Sheldrake, Sean'; Mullin, Jeanette; 'Peterson, Lance (PetersonLE@cdmsmith.com)'; Coffey, Scott; BYRD Kristopher R; JOHNSON Keith; GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP

Good afternoon Myron.

Consistent with DEQ's April 10, 2014 e-mail (see below), Siltronic Corporation (Siltronic) completed video logging of monitoring wells WS-14-125 and WS-14-161 on April 14, 2014. DEQ reviewed the video logs and concludes that dense non-aqueous phase liquids (DNAPLs) are entering the monitoring well screens and sand-packed intervals of both installations. These two monitoring wells are constructed in a single borehole and together are designated "WS-14-125/161."

In addition, as indicated in our May 20, 2014 letter commenting on the Phase 1-Step 4 Report (see footnote), DEQ concludes the screen and sand-packed intervals of monitoring wells WS-11-161 and WS-14-161 penetrate the deep aquitard and hydraulically connect the upper lower Alluvium water-bearing zone (WBZ) and the deep lower Alluvium WBZ.

Monitoring well WS-11-161 is collocated with WS-11-125 in a single borehole and the two wells together are designated "WS-11-125/161." Groundwater contamination is documented in both of these monitoring wells.

Based on the information summarized above, DEQ further concludes that:

- Monitoring wells WS-14-125 and WS-14-161 represent potential pathways for DNAPLs to migrate vertically downward into deeper intervals of the upper lower Alluvium WBZ and deep lower Alluvium WBZ; and
- Monitoring well WS-11-161 represents a potential pathway for groundwater contamination in the upper lower Alluvium WBZ to migrate vertically downward into the deep lower Alluvium WBZ.

DEQ requires that WS-11-125/161 and WS-14-125/161 be permanently abandoned through over drilling and removal consistent with OAR 690-290-0510. Siltronic should prepare and submit a work plan for this purpose for DEQ's review within 30-days of receiving this e-mail.

DEQ acknowledges and appreciates the video logs of WS-14-125/161. The logs were very useful for determining the status of the installations. Please don't hesitate to contact me with questions regarding this e-mail.

Dana

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201
E-mail: bayuk.dana@deq.state.or.us
Phone: 503-229-5543
FAX: 503-229-6899

Please visit our website at <http://www.oregon.gov/DEQ/>

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SALEM, OREGON**

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Footnote. Anchor QEA, LLC, 2014, "Data Report: Groundwater Source Control Extraction System Test - Phase 1 Step 4 - NW Natural Gasco Site," April 10, a report prepared for NW Natural.

From: BAYUK Dana

Sent: Thursday, April 10, 2014 5:41 PM

To: 'Kerry Gallagher'

Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sea@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorage.com); Carl Stivers (cstivers@anchorage.com); rjw@nwnatural.com; Rob Ede (robe@hahnenv.com); BYRD Kristopher R; GAINER Tom; LARSEN Henning; MCCLINCY Matt

Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP

Good afternoon Kerry.

DEQ reviewed the "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, Portland, OR - ECSI No. 183" dated February 14, 2014 (Abandonment Plan). As we discussed by telephone the Abandonment Plan provides insufficient information regarding decommissioning procedures, particularly with respect to over-drilling and removing monitoring well construction materials.

As requested by DEQ, the Abandonment Plan includes a task to video log the WS-14-125/161 monitoring wells before they are decommissioned. During telephone discussions we concluded the video log could provide useful information for developing the approach to decommissioning the two installations. Based on this conclusion, DEQ verbally approved Siltronic moving forward with video logging. This e-mail provides DEQ's written approval for Siltronic to proceed with the video logs of WS-14-125/161.

DEQ understands video logging will be conducted on April 11, 2014. DEQ requests that three copies of the log be provided on disc for our information and use. This e-mail also acknowledges that you notified me of the work and schedule during our phone discussion on April 3rd.

Please feel free to contact me with questions regarding this e-mail.

Dana

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201
E-mail: bayuk.dana@deq.state.or.us
Phone: 503-229-5543
FAX: 503-229-6899

Please visit our website at <http://www.oregon.gov/DEQ/>



please consider the environment before printing this email

From: Kerry Gallagher [<mailto:kgallagher@maulfoster.com>]

Sent: Friday, February 14, 2014 3:58 PM

To: BAYUK Dana

Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church,

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WATER RESOURCES DEPT
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Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchoragea.com); Carl Stivers (cstivers@anchoragea.com); rjw@nwnatural.com; Rob Ede (robe@hahnenv.com); GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: Siltronic: Monitoring Well WS-14 Abandonment WP

Dana,

As requested, please find the attached Monitoring Well WS-14 Abandonment Work Plan for your review and approval. The required hard copies of this submittal will follow by mail.

Please call or email if you have any questions. Thank you,

KERRY-CATHLIN GALLAGHER | MAUL FOSTER & ALONGI, INC.

direct: 503 501 5229 | main office: 971 544 2139 | cell: 503 896 0255 | fax: 971 544 2140 | www.maulfooster.com
2001 NW 19th Avenue, Suite 200, Portland, Oregon 97209

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SALEM, OREGON**



Oregon

John A. Kitzhaber, MD, Governor

Water Resources Department

North Mall Office Building

725 Summer St NE, Suite A

Salem, OR 97301

Phone (503) 986-0900

Fax (503) 986-0904

www.wrd.state.or.us

January 26, 2015

TRENT CASTNER MWC# 10306
CASCADE DRILLING LP
13600 SE AMBLER ROAD
CLACKAMAS, OREGON 97105

FINAL ORDER

Dear Mr. Castner:

The Special Standards Request Form you submitted for owner: Siltronic Corporation, Start Card number 1025433 (Client Number WS-14) is hereby approved for the following: You may abandon this nested monitoring well as described in your Special Standards Request Form. You may use an Organoclay based grout (see attached) to abandon the over drilled monitoring well in the intervals where NAPL is present. In intervals where NAPL is not present an approved sealing material shall be used. ***If you are going to use bentonite grout to abandon the well, then it may only be used to abandon the portion of the well that is below the static water level. Above the static water level another approved sealing material must be used.*** A copy of your Special Standards Request Form is enclosed. All other standards must be adhered to.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions regarding this letter, I may be contacted at (503) 986-0852, or by e-mail at Joel.W.Jeffery@wrdd.state.or.us.

Sincerely,

Joel Jeffery, Coordinator
Well Construction Program
Well Construction and Compliance Section

enclosure

cc: NW Region Well Inspector
File

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.





Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us

Special Standards Request Form

REQUEST FOR WRITTEN APPROVAL TO USE CONSTRUCTION METHODS NOT INCLUDED IN OREGON ADMINISTRATIVE RULES 690-200 THROUGH 690-240

Before the request can be considered, this form must be completed. Requests shall be submitted to the Well Construction Program Coordinator, Water Resources Department, 725 Summer Street NE, Suite A, Salem OR 97301-1266. Requests may also be considered by the appropriate Regional Manager.

Date of request: 1/21/2015 Oral approval date (if applicable): _____

Bonded Well Constructor (name, license #, and mailing address): Trent Castner 10306

13600 SE Ambler RD, Clackamas, OR 97105

(1) Location of Well: NW 1/4 NW 1/4 Tax lot 1200 Section 13,

Township 1 N, Range 1 W, Multnomah County

Address at well site: 7200 NW Front Ave., Portland, OR

(2) Start Card Number(s)(for work to be done): 1025433

(3) Name and Address of Land Owner: Siltronic Corporation

7200 NW Front Ave, Portland, OR

(4) Distance to the nearest septic tank, drainfield, closed sewage line (if water supply well)

Unknown

(5) The unusual site conditions which necessitate this request: Abandonment of a nested

well in a known NAPAL contaminated zones which will prevent the hydration of the bentonite in

the high solids slurry.

(6) The proposed construction methods that the bonded well constructor believes will be adequate for this well: (attach additional pages if needed)

I propose that we overdrill the nested well (original start card number 164732 client number ^{WS-13*} ~~WS-14~~) and that we

use a high solids bentonite grout combined with Oragano Clay in the zones determined to

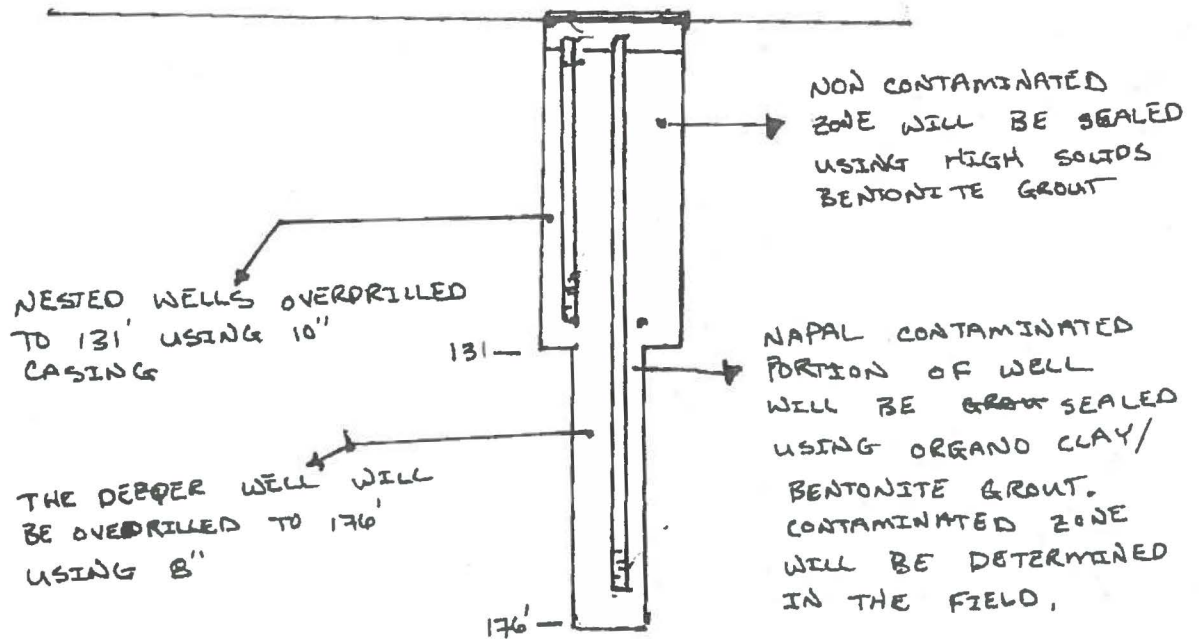
be contaminated with NAPAL. The rest of the well borehole will be abandoned using high solids benonite slurry.

* CLIENT I.D. WS 14

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JAN 23 2015

- (7) Diagram showing the pertinent features of the proposed well design and construction:
(attach additional pages if needed)



NOT TO SCALE. SEE ATTACHED ORIGINAL WELL LOG

PLEASE NOTE:

- (1) The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.
- (2) If it should be determined at some future date that the well, due to its construction, is allowing ground water contamination, waste or loss of artesian pressure, the undersigned shall return to the site and rectify the problem.
- (3) If oral approval was granted, a written request must be submitted to the Department either within three (3) working days of the date of oral approval or prior to the completion of the associated well work. Failure to submit a written request as described above may void prior oral approval.

I have read and understand the above information. I further attest that the information provided is accurate to the best of my knowledge.

Bonded Constructor Signature: J. Kent Costner
SEE ATTACHED WORK PLAN

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

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September 18, 2008

SEP 29 2008

Mr. Kristopher Byrd
Oregon Water Resources Department
Well Construction and Compliance Section
725 Summer 450-42nd Street NE, Ste A
Salem, Oregon 97310

WATER RESOURCES DEPT
SALEM, OREGON

HAI Project Nos. 2708 and 5237
DEQ ECSI File No. 84

**SUBJECT: Alternative Grout Slurry for Borehole Abandonment and Seal for
Permanent Groundwater Monitoring Wells, NW Natural Gasco Property,
7900 NW St, Helens Road and Siltronic Corporation Property, 7200 NW
Front Avenue, Portland, Oregon**

Dear Mr. Byrd:

Hahn and Associates, Inc. (HAI), on behalf of NW Natural, is requesting approval from the Oregon Water Resources Department (OWRD) for the use of a site-specific bentonite grout for soil boring abandonment work and well sealant for future groundwater monitoring or groundwater extraction wells installed as part of site investigation and cleanup activities at the above referenced contiguous properties (the Site).

NW Natural is conducting investigation and clean-up activities at the Site with oversight from the Oregon Department of Environmental Quality. The site has been impacted predominantly by polynuclear aromatic hydrocarbons, benzene, and cyanide. Trichloroethene and related degradation products have also been detected. Dissolved phase contamination and dense non aqueous phase liquid (DNAPL – a creosote-like oil with a density greater than water) are present at the Site.

As specified in OAR 690-240-0475, well seal material shall consist of a physically and chemically stable hydrated grout consisting of 1) neat cement; or 2) sodium bentonite; or 3) a cement-bentonite grout mixture containing no more than 5 percent bentonite by dry weight; or 4) sodium bentonite granules, pellets, or chips placed in an unhydrated state and subsequently hydrated downhole. OAR 690-240-0475 acknowledges that appropriate sealing materials may vary depending on site characteristics and substances being monitored.

As part of the pre-design process related to a pending source control action at the Site, Glynn Geotechnical Engineering has recently completed testing the compatibility and effectiveness of various bentonite and cement grout slurry sealing materials with contaminated groundwater and dense non aqueous phase liquids (DNAPL) obtained from the site. As provided within the attached letters of August 22 and 28, 2008 (Mark Glynn to Mike Crystal), it has been determined that a bentonite / Organoclay blend, consisting of approximately 9 parts Wyoming sodium bentonite and 1 part Organoclay by volume, and mixed to a 20% solids content, will be a superior sealant as compared to the sodium bentonite or cement bentonite grout slurries specified in OAR 690-240-0475.

The specific mixture that has been tested and recommended for use consists of granular CETCO Volclay CG-50 and PM-200 Organoclay. Technical data sheets for both of

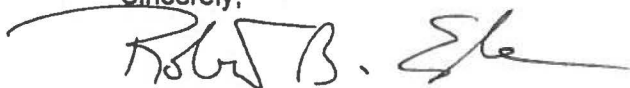
these products are attached. A technical reference document is also attached that describes the applicability and function of Organoclay as a sealant in situations where high concentrations of organic contaminants are present. Please be advised that although the CG-50 product is not marketed by CETCO as a well seal material, the supplier has indicated that it is the same bentonite source that is marketed for differing uses under various names. An advantage to the CG-50 and PM-200 Organoclay mixture is that granular sizing of the two products is similar which better ensures a homogenous blend, and that CETGO can pre-mix and bag the 9:1 bentonite / Organoclay blend – thereby eliminating the need to prepare the proper blend in the field.

Testing by Glynn Geotechnical Engineering has determined that to achieve a slurry that is 20% solids (by volume), a single bag of the blend weighing 50 pounds should be mixed with 18.26 gallons of water. The solution should be blended with an electric paddle mixer. The resulting mud weight of the 20% solids solution will be 71.7 pounds per cubic foot (plus or minus 1 pound per cubic foot). The preceding equates to a mud weight of between approximately 9.5 to 9.7 pounds per gallon at a 20% solids content.

We are seeking approval from OWRD and DEQ to use the bentonite / Organoclay grout slurry mixture described above for those applications necessitating the use of a grout slurry sealant. All requirements concerning placement method and appropriate depth of placement within the borehole or well annulus, as well as verification of the appropriate mud weight, will remain as specified within OAR 690-240. Approval from the DEQ for use of the bentonite / Organoclay grout slurry described herein is being requested concurrently with this request to OWRD.

Should you have any questions, please contact the undersigned.

Sincerely,



Rob Ede, R.G.
Principal

robe@hahnenv.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Mr. John Edwards, Anchor Environmental, L.L.C.
Mr. Dana Bayuk, DEQ NW Region
Mr. Henning Larsen, DEQ NW Region
Mr. Tom Gainer, DEQ NW Region
Mr. Tom McCue, Siltronic Corporation

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ATTACHMENT A

**Glynn Geotechnical Engineering Documentation:
Well Seal Evaluation and Recommendations**

**Correspondence dated:
August 22, 2008 and August 29, 2008**

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SALEM, OREGON**



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August 22, 2008

Sevenson Environmental Services
2749 Lockport Road
Niagara Falls, NY 14304

ATTN: Mr. Michael D. Crystal
Vice President

SUBJECT: Well Seal Evaluation
Gasco Site, Portland Oregon
GGE 05-1043C

Dear Mr. Crystal:

In response to your request I have reviewed the current issue regarding the failure of sealing materials in groundwater wells at the Gasco site. Based on substantive test data, it is my professional opinion that the bentonite/organo clay blend would be an effective replacement for plain bentonite grout in the construction of groundwater monitoring wells at the Gasco site.

By way of a few past projects, Glynn Geotechnical Engineering (GGE) has tested a recipe of bentonite and organo clay as a sealant against groundwater that contained significant DNAPL hydrocarbons. In each and every case the bentonite/organo clay blend, consisting of approximately 9 parts Wyoming bentonite and 1 part organo clay by volume, has demonstrated a compatibility with the groundwater at a permeability of less than $1.0E - 007$ cm/sec. In general, the testing has indicated the permeability tends to decrease over time as result of continuing swell characteristics of the blend.

Within the past month a test of the compatibility/permeability of the blend was completed for the Gasco project. In this test the blend was tested against the site groundwater and effectively demonstrated that the bentonite/organo clay would be an effective seal for Sevenson's patented sheeting system.

In our tests we have used bentonite identified as CETCO and Volclay. Results of our tests indicate no remarkable differences in the results from the different bentonites. These results tend to substantiate the supplier claims that the same Wyoming bentonite is sold under different names. Therefore, my recommendation for the use of the bentonite/organo clay blend is made irrespective of the identifier for the bentonite. Specifically I would support the use of CETCO Pure Gold Grout for the bentonite portion of the blend.

Please do not hesitate to contact me with any questions or comments.

Sincerely,

Mark W. Glynn, P.E.

Consulting Engineer, Principal Oregon: 804/9 P.E.

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GLYNN GEOTECHNICAL ENGINEERING

415 South Transit Street, Lockport, New York 14094
voice 716.625.6933 / fax 716.625.6983
www.glynnngroup.com

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a member of the GLYNN GROUP

August 29, 2008

Sevenson Environmental Services
2749 Lockport Road
Niagara Falls, NY 14304

Attn: Mr. Michael D. Crystal

SUBJECT: Well Seal Material Standards
Gasco Site, Portland Oregon
GGE 05-1043C

Dear Mr. Crystal:

On August 22, 2008 I sent you a letter regarding my evaluation of a bentonite/organo clay blend that would serve as a proper seal for monitoring wells at the Gasco Site. The proposed blend is comprised of 90% bentonite and 10% Organo Clay by volume.

To achieve a solution of 20% solids (by volume), a single bag of the blend weighing 50 pounds should be mixed with 18.26 gallons of water. The mud weight of the solution, as testing in the lab is 71.7 pcf. This unit weight was determined 15 minutes after the addition of water. The field measured unit weight should be expected to vary by no more than 1.0 pcf. We suggest that the solution be blended with an electric paddle mixer.

Please contact me directly if you need additional information.

Sincerely,



8.29.08

Mark W. Glynn, P.E.
Consulting Engineer, Principal

Civil • Structural • Geotechnical • Materials Testing • Consulting

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ATTACHMENT B

Technical Data Sheets:

CETCO Volclay CG-50
and
CETCO PM-200 Organoclay

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HAHN AND ASSOCIATES, INC.



Physical Properties

Volclay® CG-50

Description:	Volclay CG-50 is a natural, granular, high-swelling Wyoming sodium bentonite recommended for lining/sealing applications involving moist soils or those where it is necessary to minimize dust generation.								
Applications:	Soil/bentonite liners; general sealing applications								
Composition:	Sodium bentonite is a hydrous silicate of alumina primarily consisting of the clay mineral montmorillonite, which swells several times its own volume when, wetted.								
Free Swell	24 ml/2g minimum (ACC 1010)								
Filtrate Loss:	18 ml maximum (API 13A)								
Moisture Content:	12 percent maximum as shipped								
Particle Sizing:	5 percent max. retained on a #10 mesh (2.00 mm) sieve 15 percent max. passing a #200 mesh (75 mm) sieve (ASTM D422)								
Dry Bulk Density:	65 lbs/ft ³ (1,040 kg/m ³) typical								
Packaging:	50 lb (22.5 kg) multi-wall paper bags; 2000-lb (900 kg) or 4,000 lb (1,800 kg) super sacks; or bulk.								
Availability:	F.O.B. Lovell, WY. Quantities less than 1 ton may be available locally.								
Application Information:	<table border="1"> <thead> <tr> <th>Primary Soil Type</th><th>Typical Application Rate*</th></tr> </thead> <tbody> <tr> <td>Sand</td><td>8-10 lbs/ft² (40-50 kg/m²)</td></tr> <tr> <td>Silt</td><td>4-8 lbs/ft² (20-50 kg/m²)</td></tr> <tr> <td>Clay</td><td>2-4 lbs/ft² (10-20 kg/m²)</td></tr> </tbody> </table> <p>*Application rates are for a soil/bentonite liner mixed in a layer 6 inches (150mm) in thickness with a permeability of 1×10^{-7} cm/sec. Application rates above are shown for informational purposes only. All soils should be tested to determine specific application rates.</p>	Primary Soil Type	Typical Application Rate*	Sand	8-10 lbs/ft ² (40-50 kg/m ²)	Silt	4-8 lbs/ft ² (20-50 kg/m ²)	Clay	2-4 lbs/ft ² (10-20 kg/m ²)
Primary Soil Type	Typical Application Rate*								
Sand	8-10 lbs/ft ² (40-50 kg/m ²)								
Silt	4-8 lbs/ft ² (20-50 kg/m ²)								
Clay	2-4 lbs/ft ² (10-20 kg/m ²)								

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Revised 3/03

1500 W. Shure Drive • Arlington Heights, IL 60004 • USA • (847) 392-5800 • FAX (847) 577-5571 /www.CETCO.com
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The information and data contained herein are believed to be accurate and reliable. CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information.



Technical Data

PM-200 ORGANOCCLAY

MATERIAL PROPERTY	TEST METHOD	VALUE
Bulk Density Range	CETCO Test Method	44 – 56 lbs/ft ³
Particle Size Distribution	US Standard Sieve Size	
	No.10 (Retained)	1% Maximum
	No.30 (Retained)	70% Minimum
	No.50 (Retained)	25% Maximum
	No.100 (Retained)	3% Maximum
	No.100 (Passing)	1% Maximum
Hydraulic Conductivity	ASTM D 5084 modified	1 x 10 ⁻³ cm/sec minimum
Oil Adsorption Capacity	CETCO Test Method	0.5 lb of oil per lb of Organoclay minimum
Quaternary Amine Content	CETCO Test Method	25 – 33% quaternary amine loading

A proprietary granular clay compound that reliably adsorbs oil and similar organics from water.

Packaging – 1,500 lb. supersacks (with approximately 22-24 tons per flatbed truck).

Rev. 3 - 8/8/07



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SALEM, OREGON

1500 West Shure Drive 5th Floor, Arlington Heights, IL 60004 USA 800.527.9948 Fax 847.577.5566
For the most up-to-date product information please visit our website, www.sedimentremediation.com
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The information and data contained herein are believed to be accurate and reliable, CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information.

ATTACHMENT C
CETCO Technical Reference
Organoclay Media as a Sealant Additive

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UTILIZING ORGANOCCLAY™ MEDIA AS A SORBENT ADDITIVE TO DECREASE ORGANIC MOBILITY AND HYDRAULIC CONDUCTIVITY

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SALEM, OREGON

BACKGROUND

Organic contaminants migrating with groundwater sources continue to offer significant challenges in terrestrial remediation applications. While selective media such as granular activated carbon (GAC) have proven to be successful at adsorbing soluble organics, these media may have reduced performance due

to blinding in the presence of high molecular weight organic matter and may be prematurely saturated due to the active sites competing for inorganic matter as well as the organic contaminants of concern. An alternative technology is emerging that addresses this problem with a clay-based adsorption media, which effectively and efficiently stabilizes low-soluble organic matter. Organoclay™ Media utilizes granular sodium bentonite clay, which has been chemically modified to attract organic matter without absorbing water. The unique platelet structure of bentonite provides tremendous surface area and the capacity of the media to adsorb over 60 percent (by weight) in organic matter.

Organoclays have been utilized as additives to permeable reactive barriers (PRB), amendments to soil liners and as a soil stabilization agent to reduce the transport of organic contaminants. The primary focus has been on the ability for this specialty sorbent to effectively adsorb low soluble organic matter from aqueous solutions. Organoclay has been also been used as an additive to soil containment barriers and low permeable slurry walls. It has been shown to reduce transport of organic contaminants and improve the hydraulic conductivity characteristics when petroleum based hydrocarbons are present. (Boldt-Leppin, Haug and Headley, 1996).

APPLICABILITY AS A SOIL SEALANT

Sodium bentonite clay has been utilized as soil admix for hydraulic barriers for a variety of remedial applications. The primary benefit of utilizing this specialty mineral is the fact that it is very hydrophilic and swells many times (by volume) in the presence of fresh water. The result is a barrier of very low hydraulic conductivity ($< 10^{-9}$ m/s typical). The design of these barrier systems has focused on minimizing the flow of water. However, even with hydraulic conductivities of less than 10^{-7} cm/s, the mass flux of many organic contaminants can be significant. While bentonite clay is able to minimize the advective flow of suspended contaminants, transport due to molecular diffusion can be a critical transport mechanism (Lake and Rowe, 2000, 2004). The inability of typical clays to impede diffusive transport has lead to new research on utilizing Organoclay and other specialty sorbents to amend standard bentonite-soil barriers. Recent studies have shown that hydraulic conductivity of sodium bentonite and earthen barriers amended with 3% (by weight) of certain types of Organoclay met or surpassed regulatory requirements of 1×10^{-7} cm/s. More importantly, transport simulations indicated that these modified barriers can retard benzene transport. (Hunt, Smith, Burns and Rabideau, 2005).

APPLICABILITY IN SOIL-BENTONITE SLURRY WALLS

Slurry walls are physical barriers used to contain or direct the flow of groundwater. Most slurry walls are constructed of native soils, bentonite clay and water mixture. Portland cement and other self

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800.527.9948 Fax 847.577.5566

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hardening components are also often used if the design requires lower permeability ($< 10^{-7}$ cm/s) or higher compressive strength. While these engineered barriers have long been used in construction applications to control seepage, they continue to gain popularity in remedial applications for the containment and redirection of contaminated groundwater. When constructing slurry walls, permeability is the critical parameter for designers and regulators. However, incompatibilities between traditional construction materials and site contaminants (if they are organic in nature) have lead to the development of new compositions of traditional soil-bentonite slurry walls. These new designs include specialty sorbents to more effectively contain shorter chain hydrocarbons and other organic matter that may be capable of passing through barriers with permeability as low as 10^{-7} cm/s. When mixed in to a standard slurry wall mix at a 2% (by weight) addition rate, Organoclay has proven to effectively minimize the migration of medium to light hydrocarbons previously passing through the barrier. Furthermore, within 14 days the perm value of the amended slurry wall was almost an order of magnitude lower than the standard bentonite formulation.

APPLICABILITY AS A SPECIALTY GROUT

Sheet piling consists of a series of panels with interlocking connections, driven into the ground to form an impermeable barrier. These panels can be constructed from a variety of materials such as steel, vinyl and plastic depending on the site specific contaminants present. While these specialty engineered barriers have proven to be impervious to aqueous solutions and migrating organic matter, they are sometimes susceptible to these solutions passing through the interlocking joints if not installed and sealed properly. A new specialty grout incorporating Organoclay and high swelling sodium bentonite clay has proven successful in creating an impermeable seal in the open cavities within these joints. Furthermore, the addition of Organoclay to this grout ensures that organic material migrating with these solutions will not pass beyond the piling. Grouts of this type may be used to seal known areas of high infiltration or permeable formations.

SUMMARY

Terrestrial remediation projects for organic contaminants pose many challenges for traditional technologies. Organoclay amendments to PRBs, soil liners, GCLs, slurry walls and grouts may be used to improve their performance preventing migration of these organic contaminants in both permeable and impermeable engineered barriers. Because individual site characteristics vary, project specific testing should be conducted to determine applicability.

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MAUL FOSTER ALONGI

2001 NW 19th Avenue, Suite 200 | Portland, OR 97209 | 971 544-2139 | www.maulfooster.com

November 7, 2014
Project No. 8128.01.08

Mr. Dana Bayuk
Oregon Department of Environmental Quality
2020 SW 4th Avenue
Portland, Oregon 97201-4987

Re: Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan
Siltronic Corporation
7200 NW Front Avenue, Portland, OR
ECSI No. 183

Dear Dana:

On behalf of Siltronic Corporation (Siltronic), Maul Foster & Alongi, Inc. (MFA) has prepared this letter in response to direction from the Oregon Department of Environmental Quality (DEQ) to abandon nested monitoring well pairs WS-11 and WS-14 on the Siltronic property. Direction to abandon WS-14 was provided in DEQ's January 28, 2014 e-mail correspondence to Siltronic documenting a January 27, 2014 telephone conversation.

The initial version of this work plan was submitted to DEQ on February 14, 2014 to which DEQ responded in an email dated April 10, 2014. DEQ's April 10th email informed Siltronic that there were insufficient details regarding the well abandonment procedures and provided their approval to proceed with the well inspection video logging for WS-14-125/161 to support scoping and planning of the abandonment work. The video log inspection of the WS-14 monitoring well pair was submitted to DEQ on April 25, 2014. DEQ responded with comments in an email dated June 25, 2014. MFA incorporated DEQ comments and submitted a revised work plan on July 25, 2014. On September 18, 2014, DEQ responded with comments in a letter *Abandonment of the WS-11 and WS-14 Monitoring Well Clusters and Installation of a Deep Monitoring Well* and requested that a revised work plan be submitted to DEQ by October 6, 2014. To expedite DEQ's review, MFA provided a draft of the revised text to DEQ on October 6th prior to the final document being produced. DEQ responded in a letter on October 22nd with their approval of the final document and implementation subject to incorporating their comments. This Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan is a revision of previous versions and incorporates DEQ's September 18th and October 22nd comments; a separate submittal will be provided addressing DEQ's September 18th request for a replacement monitoring well. For reference, DEQ correspondence is included in Attachment A.

BACKGROUND

The nested monitoring well pairs WS-14 and WS-11 are located near the north (and northwest) corner of the Siltronic property as shown in the attached figure. The wells were

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completed in October 2003 (WS-11) and July 2004 (WS-14) and constructed in accordance with then-approved DEQ and Oregon Water Resources Department (OWRD) design specifications of 2-inch diameter, flush threaded, Schedule 40 polyvinyl chloride (PVC) riser pipe; and 2-inch diameter, stainless steel wire wrapped 0.010-inch slot screen; and 2-inch diameter stainless steel sump.

Monitoring well WS-11-125 was completed to 125 feet below ground surface (bgs) and monitoring well WS-11-161 was completed to 161 feet bgs, the same completion depths correlate with WS-14-125 and WS-14-161, respectively. The screened interval is 15 feet in primarily silt and sand for all four wells with a 1 foot sump at the bottom. The monitoring well construction logs are included in Attachment B.

The monitoring well pair WS-11 is identified by OWRD as well log ID "MULT 72126". For monitoring well pair WS-14, the OWRD log "MULT 73686" reports the well number as WS-13, but the reported well number appears to be incorrect. The correct OWRD well log file for WS-14 is "MULT 73686." The OWRD well logs are included in Attachment C.

Per DEQ direction in their email dated January 28, 2014, a video inspection of the inside of monitoring wells WS-14-125 and WS-14-161 was completed to identify the potential causes for the presence of manufactured gas plant (MGP) dense, non-aqueous phase liquid (DNAPL) in WS-14-161. The video logs were submitted to DEQ on April 25, 2014 for review showing the joints in the WS-14 well pair to be intact. At that time, only the WS-14 well pair was scheduled to be abandoned. In the DEQ email dated June 25, 2014, DEQ directed Siltronic to also abandon well pair WS-11-125 and WS-11-161.

MONITORING WELL DECOMMISSIONING

Public and private utility-locating services and other information sources will be used to check for underground utilities before work begins. MFA will coordinate fieldwork to locate possible on-site utilities and piping or other subsurface obstructions. Prior to overdrilling, an air knife will be used to 10 feet bgs around the wells to verify clearance from potential subsurface obstructions. For reference, site features near WS-11 and WS-14, including known utility lines and monitoring wells, are shown on the attached figure.

The monitoring well abandonment will be conducted in accordance with applicable regulations including Oregon Administrative Record (OAR) 690-240-0510, DEQ Guidance Document titled Groundwater Monitoring Well Drilling, Construction, and Decommissioning¹, and previously approved protocols for abandoning monitoring wells at the NW Natural and Siltronic sites including an OWRD variance to use bentonite or organoclay/bentonite slurry if MGP DNAPL is encountered.

The abandonment procedures will include, but not be limited to, the following:

¹ DEQ. 1992. Groundwater Monitoring Well Drilling, Construction, and Decommissioning. Technical Guidance. Oregon Department of Environmental Quality. August 24.

- Measuring the depth to water and depth to bottom of the monitoring well
- Checking for the presence of MGP DNAPL and measuring its depth and thickness in each of the four monitoring wells, where present DNAPL will be removed to the maximum extent practicable before well abandonment work is initiated
- Using a sonic drilling rig, overdrilling the 2-inch-diameter PVC/steel monitoring wells to the depth necessary to confirm the removal of well construction materials:
 - A 10-inch casing will be used from ground surface to a minimum of 5-feet below the bottom of the sand pack (approximately 130 feet bgs) at monitoring wells WS-11-125 and WS-14-125. Advancement of the 10-inch casing may continue depending on observations made in the field of the material from this depth, then
 - An 8-inch casing will be used to remove the remaining well construction materials to the bottom of the borehole.
- The WS-14 monitoring well cluster will be overdrilled to minimum depth of 15-feet below the bottom of the filter pack for WS-14-161. The material retrieved from below the bottom of the filter pack will be visually inspected for evidence of DNAPL. If evidence of DNAPL is observed then the boring will be advanced ten additional feet and the material from the bottom of the borehole will be inspected for evidence of DNAPL. This process will be repeated until no evidence of DNAPL is observed at which time borehole sealing will proceed.
- Unless DNAPL is detected in monitoring well WS-11-161, the WS-11 monitoring well cluster will be overdrilled to a minimum of 5-feet below the bottom of the filter pack for WS-11-161 to ensure the complete removal of casing, screen, and sand from the borehole. In the event DNAPL is detected in WS-11-161 Siltronic will follow the overdrilling procedure for the WS-14 monitoring well cluster.
- Consistent with site-specific requirements for preparation and use (i.e., OWRD-approved variance), organoclay-bentonite sealant will be used throughout the depth intervals where available information (e.g., boring logs, TarGOST® logs, observations made during abandonment work) provides evidence of DNAPL occurrence.
- Use of the organoclay-bentonite mix will be documented in detail. Documentation should include but is not limited to, Siltronic providing the basis for identifying the depth interval(s) where the organoclay-bentonite sealant was used; mud-weight measurements for each volume of slurry mixed and pumped downhole; the total volume of slurry used; and the estimated depth of slurry placement.
- The remaining portions of the borehole will be sealed using materials consistent with the requirements of OAR 690-240-510
- Surface completion to match the surrounding area

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Mr. Dana Bayuk
November 7, 2014
Page 4

Project No. 8128.01.08

- Monitoring well construction materials, soil, decontamination liquid and groundwater generated during the well abandonment will be contained and staged on-site. Well abandonment materials will be characterized and managed consistent with the procedures established for investigation derived waste generated within the TCE Contaminated Material Management Area.

REPORTING

MFA will submit a report to DEQ documenting the abandonment work within 45 days of completing the fieldwork.

SCHEDULE

MFA is prepared to begin work upon DEQ review and approval of the proposed approach, subject to availability of subcontractors.

Sincerely,

Maul Foster & Alongi, Inc.



Kerry-Cathlin Gallagher
Project Scientist



James G.D. Peale, RG
Principal Hydrogeologist

Attachment: Figure
Attachment A—DEQ Correspondence
Attachment B—Monitoring Well Completion Logs
Attachment C—OWRD Well Logs

cc: Myron Burr, Siltronic Corporation
Alan Gladstone, Davis Rothwell Earle & Xochihua, P.C.
Ilene Gaekwad, Davis Rothwell Earle & Xochihua, P.C.
William Earle, Davis Rothwell Earle & Xochihua, P.C.
Chris Reive, Jordan Ramis
Keith Johnson, DEQ
Tom Gainer, DEQ
Henning Larsen, DEQ
Kristopher Byrd, OWRD
Sean Sheldrake, EPA
Rich Muza, EPA
Lance Peterson, CDM Smith

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Mr. Dana Bayuk
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Project No. 8128.01.08

Scott Coffey, CDM Smith
Bob Wyatt, NW Natural
Patty Dost, Pearl Legal Group, LLC
John Edwards, Anchor QEA, LLC
John Renda, Anchor QEA, LLC
Rob Ede, Hahn and Associates, Inc.

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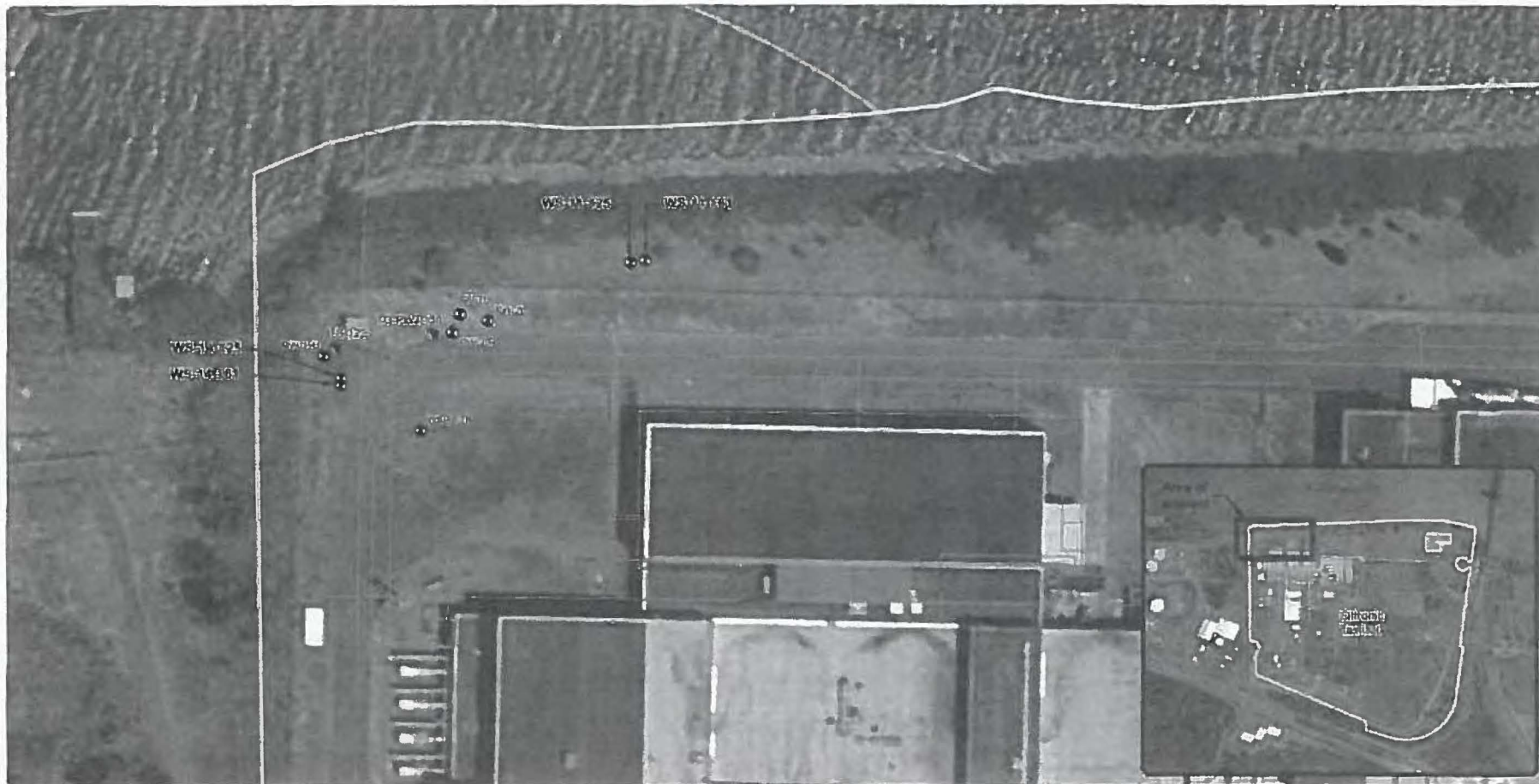
FIGURE



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Source: Aerial photograph obtained from Esri ArcGIS Online.

Note:
Locations are approximate
and shown for reference only.

Legend

- NW Natural Station
- Siltronic Monitoring Well
- ◆ TarGOST Boring
- - - Utility Line (Siltronic)
- Siltronic Tax Lot

Figure
Monitoring Well WS-14
and WS-11 Locations

Siltronic Corporation
Portland, Oregon

0 20 40
Feet



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PAUL FOSTER ALONGI
544 218-7111 www.moulfooster.com
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ATTACHMENT A

DEQ CORRESPONDENCE



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Oregon

John A. Kitzhaber, MD, Governor

Department of Environmental Quality

Northwest Region Portland Office

2020 SW 4th Avenue, Suite 400

Portland, OR 97201-4987

(503) 229-5263

FAX (503) 229-6945

TTY (503) 229-5471

September 18, 2014

Also Sent Via E-mail

Mr. Myron Burr
Siltronic Corporation
7200 Front Avenue, M/S 30
Portland, OR 97210-3676

**Re: Abandonment of the WS-11 and WS-14 Monitoring Well Clusters and Installation of a Deep Monitoring Well
Siltronic Corporation Facility
Portland, Oregon
ECSI No. 183**

Dear Mr. Burr:

The Oregon Department of Environmental Quality (DEQ) reviewed the "Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan - Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI No. 183" dated July 25, 2014 (Revised Abandonment Plan). The Revised Abandonment Plan provides the approach Siltronic Corporation (Siltronic) proposes using to abandon the WS-11 and WS-14 nested double-completion monitoring well clusters. Maul Foster and Alongi, Inc. (MFA) prepared the Revised Abandonment Plan on behalf of Siltronic.

The primary purpose of this letter is to inform Siltronic that DEQ:

- Approves the Revised Abandonment Plan subject to the document being revised as indicated in this letter; and
- Requires a monitoring well to be drilled and constructed in the vicinity of the WS-11 cluster to replace the two deep installations being abandoned.

DEQ's condition for approving the Revised Abandonment Plan and additional information regarding drilling and installing the deep monitoring well are provided below.

Abandonment of the WS-11 and WS-14 Monitoring Well Clusters

DEQ approves the Revised Abandonment Plan subject to the condition that the document be revised to include the following steps:

- In addition, to checking for the presence of dense non-aqueous phase liquid (DNAPL) and measuring its thickness in each of the four monitoring wells, where present DNAPL will be removed to the maximum extent practicable before abandonment work is initiated.
- Unless DNAPL is detected in monitoring well WS-11-161, the WS-11 monitoring well cluster will be overdrilled to a minimum of 5-feet below the bottom of the filter pack for WS-11-161 to ensure the complete removal of casing, screen, and sand from the borehole. In the event DNAPL is detected in WS-11-161 Siltronic will follow the overdrilling procedure for

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the WS-14 monitoring well cluster.

- The WS-14 monitoring well cluster will be overdrilled to a minimum depth of 15-feet below the bottom of the filter pack for WS-14-161. The material retrieved from below the bottom of the filter pack will be visually inspected for evidence of DNAPL. Absent visual evidence of DNAPL, sealing of the borehole will proceed. If evidence of DNAPL is observed then the boring will be advanced ten additional feet and the material from the bottom of the borehole will be inspected for evidence of DNAPL. This process should be repeated until no evidence of DNAPL is observed at which time borehole sealing will proceed.
- Consistent with site-specific requirements for preparation and use, organoclay-bentonite sealant will be used throughout the depth intervals where available information (e.g., boring logs, TarGOST® logs, observations made during abandonment work) provides evidence of DNAPL occurrence.
- Use of the organoclay-bentonite mix will be documented in detail. Documentation should include but is not limited to, Siltronic providing the basis for identifying the depth interval(s) where the organoclay-bentonite sealant was used; mud-weight measurements for each volume of slurry mixed and pumped downhole; the total volume of slurry used; and the estimated depth of slurry placement.
- The remaining portions of the borehole should be sealed using materials consistent with the requirements of OAR 690-240-510.
- Well abandonment materials will be characterized and managed consistent with the procedures established for investigation derived waste generated within the TCE Contaminated Material Management Area.
- Siltronic will submit the report documenting abandonment work within 45-days of completing work in the field.

The Revised Abandonment Plan should be revised to include the information indicated above and submitted to DEQ on or before October 6, 2014.

Replacement Monitoring Well Drilling and Installation

DEQ requires that Siltronic drill and install a deep monitoring well in the vicinity of the WS-11 monitoring well cluster to replace the two deep installations being abandoned. The replacement well will be used to monitor groundwater levels and chemistry in the deep Lower Alluvium WBZ beneath the "deep aquitard." The data from the installation will be used to further evaluate water level differences between the upper Lower Alluvium water-bearing zone (WBZ) and deep Lower Alluvium WBZ, and groundwater chemistry in the deep Lower Alluvium WBZ. The monitoring well will also be incorporated into Alluvium WBZ hydraulic control and containment system performance monitoring program.

The replacement monitoring well should be constructed in a separate borehole from the WS-11 double-completion installation. The replacement monitoring well should be drilled to a depth that ensures that the top of the filter pack is below the bottom of the deep aquitard. Before field work begins, Siltronic should submit a work plan for drilling and installing the monitoring well for DEQ's review and approval. The plan should include information regarding the proposed

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Mr. Myron Burr
Siltronic Corporation
September 18, 2014
Page 3 of 3

location, projected depth and basis, drilling methodology, and construction methodology and materials. DEQ requests that Siltronic submit the deep monitoring well drilling and installation plan for our review on or before October 20, 2014.

Please contact me with questions regarding this letter.

Sincerely,

Dana Bayuk

Cc: Alan Gladstone, Davis Rothwell Earle and Xochihua
Bill Earle, Davis Rothwell Earle and Xochihua
Chris Reive, Jordan Ramis
James Peale, MFA
Kerry Gallagher, MFA
Bob Wyatt, NW Natural
Patty Dost, Pearl Legal Group
John Edwards, Anchor QEA, LLC
John Renda, Anchor QEA, LLC
Rob Ede, Hahn & Associates, Inc.
Sean Sheldrake, EPA
Rich Muza, EPA
Lance Peterson, CDM Smith
Scott Coffey, CDM Smith
Kris Byrd, Oregon Water Resources Department
Keith Johnson, NWR/C&SA
Tom Gainer, NWR/C&T
Henning Larsen, NWR/C&T
ECSI No. 183 File

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Oregon

John A. Kitzhaber, MD, Governor

Department of Environmental Quality

Northwest Region Portland Office

2020 SW 4th Avenue, Suite 400

Portland, OR 97201-4987

(503) 229-5263

FAX (503) 229-6945

TTY (503) 229-5471

October 22, 2014

Also Sent Via E-mail

Mr. Myron Burr
Siltronic Corporation
7200 Front Avenue, M/S 30
Portland, OR 97210-3676

**Re: Abandonment of the WS-11 and WS-14 Monitoring Well Clusters - Siltronic Corporation Facility
Portland, Oregon
ECSI No. 183**

Dear Mr. Burr:

The Oregon Department of Environmental Quality (DEQ) reviewed the "Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan – Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI 183" dated October 6, 2014 (Final Revised Abandonment Plan). The Final Revised Abandonment Plan presents the approach Siltronic will be using to abandon the WS-11 and WS-14 nested double-completion monitoring well clusters. Maul Foster and Alongi, Inc. (MFA) prepared the Final Revised Abandonment Plan for Siltronic Corporation (Siltronic) based on DEQ's September 18, 2014 comments on the Revised Abandonment Plan¹.

The primary purpose of this letter is to inform Siltronic that based on our review, DEQ:

- Acknowledges the Final Revised Abandonment Plan has been revised consistent with our September 18th comments letter; and
- Approves the Final Revised Abandonment Plan for finalization and implementation subject to the document being revised as follows:
 - The first paragraph summarizes correspondence related to the abandonment of the WS-11 and WS-14 monitoring well clusters. The paragraph is missing a reference to DEQ's April 10, 2014 e-mail: 1) informing Siltronic that the Draft Abandonment Plan² lacked details regarding well abandonment procedures; and 2) approving video logging of the monitoring wells in the WS-14 cluster to support scoping and planning of the abandonment work.
 - The Final Revised Abandonment Plan removes references to the use of 10-inch and 8-inch casing for overdrilling the WS-11 and WS-14 monitoring well clusters. DEQ understands from telephone conversations with MFA that these casing sizes will be used. DEQ further understands that the 10-inch casing will be advanced to a minimum of 5-feet below the bottom of the sand pack at monitoring wells WS-11-125 and WS-14-125. Advancement of the 10-inch casing may continue depending on observations made in the field of the material from this

¹ MFA, 2014, "Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan – Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI 183," July 25, a work plan prepared for Siltronic Corporation.

² MFA, 2014, "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI No. 183," February 14, a work plan prepared on behalf of Siltronic Corporation.

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Myron Burr
Siltronic Corporation
October 22, 2014
Page 2 of 2

depth. The 8-inch casing will be used to remove well construction materials to the bottom of the borehole consistent with the procedures identified in the abandonment plan. This information should be incorporated into the Final Abandonment Plan.

DEQ requests that Siltronic incorporate the final changes indicated above and submit the Final Abandonment Plan on or before November 7, 2014.

Please don't hesitate to contact me with questions regarding this letter.

Sincerely,

Dana Bayuk
Project Manager
Cleanup and Site Assessment Section

Cc: Alan Gladstone, Davis Rothwell Earle and Xochihua
Bill Earle, Davis Rothwell Earle and Xochihua
Ilene Gaekwad, Davis Rothwell Earle and Xochihua
Chris Reive, Jordan Ramis
James Peale, MFA
Kerry Gallagher, MFA
Bob Wyatt, NW Natural
Patty Dost, Pearl Legal Group
Ben Hung, Anchor QEA, LLC
John Edwards, Anchor QEA, LLC
John Renda, Anchor QEA, LLC
Rob Ede, Hahn & Associates, Inc.
Sean Sheldrake, EPA
Rich Muza, EPA
Lance Peterson, CDM Smith
Scott Coffey, CDM Smith
Kris Byrd, Oregon Water Resources Department
Keith Johnson, NWR/C&SA
Tom Gainer, NWR/C&T
Henning Larsen, NWR/C&T
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ATTACHMENT B

MONITORING WELL COMPLETION LOGS



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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
1 of 11

Project Name: Wacker Siltronic Corporation
Project Location: 7200 Northwest Front Avenue, Portland Oregon 97210
Start/End Date: 9/21/03 to 10/3/03
Driller/Equipment: Prosonic Corporation/Rotosonic
Geologist/Engineer: Tony Silva
Sample Method: 4x6 Core Barrel

TOC Elevation (feet NGVD): 31.8500
Surface Elevation (feet NGVD): 31.9350
Northing: 7624628.3
Easting: 705147.0
Hole Depth: 207.0-feet
Outer Hole Diam: 9.0/6.0-inch

Depth (feet, BGS)	Well Details	Sample Data				Blows/6"	Lithologic Column	Soil Description
		Interval	Percent Recovery	Collection Method	Number	Name (Type)		
1		100%		CB		PID = 0.0		0.0 to 0.5 feet: TOPSOIL, GRAVELLY SILT (ML); grayish brown; 20% fines, non plastic; 30% gravel, medium, subangular; 50% organic debris, rootlets, woody debris; moist
2								0.5 to 1.5 feet: SANDY GRAVEL (GP); brownish-gray; 40% sand, fine to medium; 60% gravel, fine, subangular to subrounded; dry. (Fill)
3						PID = 0.0		1.5 to 7.0 feet: SAND (SP); light brown; 95% sand, medium; 5% gravels, fine to medium, subrounded; moist. (Fill)
4		100%		CB		PID = 0.0		
5								
6								
7		100%		CB		PID = 0.0		7.0 to 12.0 feet: SAND (SP); dark brown; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)
8								
9						PID = 0.0		
10								
11						PID = 0.0		
12								
13						PID = 0.0		12.0 to 16.0 feet: WOOD; core of wood; staining at upper end of wood; naphthalene or petroleum like odor. (Fill)
14								
15						PID = 0.0		
16		100%		CB				16.0 to 17.0 feet: SAND (SP); dark brown; 100% sand, fine to medium; trace fines and gravels; moist. Possibly drilling stuff from trying to clean out the hole from the wood. (Fill)
17								17.0 to 18.0 feet: WOOD; core of wood; staining at upper end of wood; naphthalene or petroleum like odor. (Fill)
18		100%		CB		PID = 0.0		18.0 to 19.0 feet: SAND (SP); light brown, moist; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)
19								19.0 to 21.0 feet: SANDY SILT (ML-SM); light gray; 50% fines, non plastic; 50% sand, fine to medium; dry. Brittle, breaks apart in flakes. (Fill)
20						PID = 0.0		

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

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Maul Foster & Alongi, Inc.				Geologic Borehole Log/Well Construction					
				Project Number 8128.01.06		Well Number WS-11		Sheet 2 of 11	
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Lithologic Column	Soil Description	
				Collection Method	Number	Name (Type)			
21						PID = 0.0		21.0 to 27.0 feet: SAND (SP); reddish-brown; 90% sand, fine to medium; 10% gravel, fine to medium, subrounded; dry to moist. (Fill)	
22						PID = 0.0			
23						PID = 0.0		@ 22.5 feet: 0.2-foot layer color change to light gray. Steel debris, possibly steel shackle from a padlock.	
24						PID = 0.0			
25									
26									
27			90%	CB		PID = 0.0		27.0 to 28.0 feet: NO RECOVERY.	
28								28.0 to 31.5 feet: SAND (SP); dark gray; 95% sand, fine to medium; 5% gravels, subrounded; wet. (Fill)	
29						PID = 0.0			
30									
31									
32						PID = 13.5		31.5 to 37.0 feet: SILTY SAND to SANDY SILT (SM-ML); dark gray; 50% fines, non plastic; 50% sand, fine; organic debris, roots; moist to wet.	
33						PID = 7.0		@ 31.5 feet: 0.2-foot thick layer of staining, sheen. Petroleum like odor.	
34									
35						PID = 0.0			
36									
37			90%	CB		PID = 0.0		37.0 to 38.0 feet: NO RECOVERY.	
38								38.0 to 41.0 feet: SANDY SILT (ML); dark gray; 60% fines, non plastic; 40% sand, fine; organic debris, wood, roots; wet.	
39									
40						PID = 0.0			
41									
42								41.0 to 47.0 feet: SILTY SAND (SM); dark gray; 25% fines, non plastic; 75% sand, fine to medium; organic debris, roots, woody debris; wet. Faint petroleum-like odor.	

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06Well Number
WS-11Sheet
3 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
43									
44									
45						PID = 0.0			
46									
47			100%	CB		PID = 0.0			47.0 to 50.0 feet: SILTY SAND (SM); dark gray; 40% fines, non plastic; 60% sand, fine to medium; micaceous; organic debris; wet.
48									
49									
50						PID = 0.0			50.0 to 53.5 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet.
51									
52						PID = 0.0			
53									
54						PID = 0.0			53.5 to 54.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine sand in pockets; micaceous; organic debris.
55									54.0 to 57.0 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet.
56									
57			100%	CB		PID = 0.0			57.0 to 58.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous; organic debris; wet.
58									58.0 to 59.0 feet: SILT (ML); dark gray; 100% fines, medium plasticity, trace fine sand in pockets; micaceous; organic debris; roots; wet.
59						PID = 0.0			
60									59.0 to 60.0 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet.
61						PID = 0.0			
62									60.0 to 64.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous; organic debris; wet.
63			100%	CB		PID = 0.0			
64						PID = 0.0			
65									64.0 to 67.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium; micaceous, coarse mica flakes; wet.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed
prior to well development.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06Well Number
WS-11Sheet
4 of 11

Depth (feet, BGS)	Well Details	Interval Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
				Number	Name (Type)	Blows/ft		
66					PID = 0.0			
67		100%	CB		PID = 0.0			67.0 to 67.5 feet: NO RECOVERY; stuff.
68					PID = 0.0			67.5 to 72.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; organic debris, roots; moist to wet.
69								
70			GW		WS11-W-72.0 PID = 0.0			@ 70.0 feet: 0.2-foot layer of silt with organic debris.
71								
72		80%	CB		PID = 0.0			72.0 to 75.0 feet: NO RECOVERY; stuff.
73								
74								
75								75.0 to 78.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous, wet.
76								
77								
78					PID = 0.0			78.0 to 82.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine, micaceous; wet.
79								
80					PID = 0.0			
81								
82					PID = 0.0			82.0 to 83.0 feet: SILT (ML); dark gray; 95% fines, non plastic; 5% sand, fine, sand in pockets; micaceous; organic debris, roots; moist.
83								83.0 to 84.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; organic debris; wet.
84								84.0 to 85.5 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous, wet.
85			GW		WS11-W-87.0 PID = 0.0			85.5 to 86.0 feet: SILT (ML); dark gray; 85% fines, non plastic; 15% sand, fine, sand in pockets; micaceous, moist.
86								86.0 to 87.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 90% sand, fine; 5% organic debris, woody debris, micaceous, wet.
87		100%	CB		PID = 0.0			87.0 to 87.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; organic debris, roots; moist to wet.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector; soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed
prior to well development.

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GBLWC: W:\GINT\GINT\PROJECTS\8128-01\WS10-13.GPJ 7/2/04

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
5 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/ft		
88						PID = 0.0			fine, micaceous, wet
89									87.5 to 88.0 feet: SILT with SAND (ML); dark gray; 70% fines, non plastic;
90									30% sand, fine to medium, micaceous, organic debris, moist to wet.
91						PID = 0.0			88.0 to 92.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand,
92									fine, micaceous, wet.
93									92.5 to 94.5 feet: SILT (ML); dark gray; 90% fines, medium plasticity, 10%
94									sand, fine to medium, sand in pockets; micaceous; organic debris; wet.
95						PID = 1.5			94.5 to 98.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand,
96									fine, micaceous, wet.
97						PID = 1.5			
98									98.0 to 102.0 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non
99									plastic, 85% sand, fine to medium, micaceous, wet. Fines occur in
100									nodules, up to 0.5-inches in diameter.
101				GW		WS11-W-102.0 PID = 4.5			
102			100%	CB		PID = 13.6			102.0 to 107.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand,
103						PID = 0.0			fine to medium, red and green lithics; micaceous; wet.
104									
105						PID = 0.0			@ 105.0 feet: 0.2-foot layer of SILT (ML); dark gray; 90% fines, 10% sand,
106									fine, sand in pockets; wet.
107									@ 105.5 feet: 0.2-foot layer of SILT (ML); dark gray; 90% fines, 10% sand,
108			90%	CB		PID = 0.0			fine, sand in pockets; wet.
109						PID = 3.0			107.0 to 108.0 feet: NO RECOVERY.
110									108.0 to 112.0 feet: SILT (ML); dark gray to greenish-gray; 100% fines, low
111									to medium plasticity; micaceous; organic debris, roots, leaves; wet.
									Visible sheen on water in soil core bag.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo Ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed
prior to well development.

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WATER RESOURCES DEPT
SALEM, OREGON

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
6 of 11

Depth (feet, BGS)	Well Details	Interval Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
				Number	Name (Type)	Blows/6"		
111					PID = 3.1			
112								112.0 to 118.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
113					PID = 0.0			
114								
115								
116					WS11-W-117.0 WS11-W-DUP PID = 3.1			@ 116.0 feet: 0.1-foot layer of SILT (ML).
117								
118		100%	CB		PID = 3.1			
119					PID = 6.2			118.0 to 118.5 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; wet. Strong odor, visible sheen on soil.
120								118.5 to 119.5 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium; wet. Faint odor.
121					PID = 0.0			119.5 to 119.7 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
122								119.7 to 120.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium; micaceous; wet.
123								120.0 to 122.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
124					PID = 0.0			122.0 to 123.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium; micaceous; wet.
125								
126					PID = 0.0			123.0 to 127.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
127								
128		100%	CB		PID = 0.0			127.0 to 128.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium, red and green lithics; wet.
129								128.0 to 132.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
130					WS11-W-132.0 PID = 0.0			@ 130.0 feet: 0.3-foot layer of SILT (ML); dark gray; organic debris.
131								
132		100%	CB		PID = 0.0			132.0 to 137.0 feet: SAND (SP); dark gray with white speckles, salt and

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.



Approximate water level observed
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SALEM, OREGON

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
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Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)		
133						PID = 0.0		pepper look; 5% fines, non plastic; 95% sand, medium; micaceous; wet.
134						PID = 0.0		
135						PID = 0.0		
136						PID = 0.0		
137			70%	CB		PID = 0.0		137.0 to 140.0 feet: NO RECOVERY.
138						PID = 0.0		
139						PID = 0.0		
140						PID = 0.0		140.0 to 146.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, dark green and red lithics; micaceous; wet.
141						PID = 0.0		
142						PID = 0.0		
143						PID = 0.0		
144						PID = 0.0		
145						PID = 0.0		
146				GW	WS11-W-147.0	PID = 0.0		
147			100%	CB		PID = 0.0		146.5 to 147.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium, sand in pockets; micaceous; wet.
148						PID = 0.0		147.0 to 150.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, medium, dark green and red lithics; micaceous; wet.
149						PID = 0.0		
150						PID = 0.0		150.0 to 152.0 feet: SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium, sand in pockets; micaceous; organic debris; wet.
151						PID = 0.0		
152						PID = 0.0		152.0 to 153.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, medium, dark green and red lithics; micaceous; wet.
153						PID = 0.0		153.0 to 153.5 feet: SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium, sand in pockets; micaceous; organic debris; wet.
154						PID = 0.0		153.5 to 157 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium, red and green lithics; organic debris; wet. Fines occur in chunks or balls.
155						PID = 0.0		

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed
prior to well development.

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WATER RESOURCES DEPT
SALEM, OREGON

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
8 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
156						PID = 0.0			
157			100%	CB		PID = 0.0			@ 157.0 feet: 0.2-foot layer of SILT (ML).
158									157.2 to 160.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
159									
160						PID = 0.0			160.0 to 161.0 feet: SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium; wet.
161									161.0 to 164.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
162									@ 162.0 feet: 0.3-foot layer of SILT (ML).
163						PID = 0.0			@ 162.8 feet: 0.3-foot layer of SILT (ML).
164									164.0 to 165.0 feet: SILT (ML); dark gray to greenish-gray; 90% fines, low to medium plasticity; 10% sand, fine, sand in pockets, organic debris; wet.
165				GW		WS11-W-167.0 PID = 0.0			165.0 to 165.5 feet: SANDY SILT (ML); dark gray to greenish gray; 60% fines, non plastic; 40% sand, fine; wet.
166									165.5 to 167.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
167			80%	CB		PID = 0.0			167.0 to 169.0 feet: NO RECOVERY.
168									
169									169.0 to 170.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine, green and red lithics; wet.
170						PID = 0.0			170.5 to 171 feet: SILTY SAND (SM); dark gray; 20% fines, low plasticity; 80% sand, fine; wet.
171									171.0 to 174.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, dark green and red lithics; wet.
172									
173						PID = 0.0			
174									174.0 to 174.5 feet: SILT (ML); dark gray to greenish-gray; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; wet.
175						PID = 0.0			174.5 to 179.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium, green and red lithics; wet.
176									
177			100%	CB		PID = 0.0			

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = ground water sample, screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

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WATER RESOURCES DEPT
SALEM, OREGON

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Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction					
		Project Number 8128.01.06		Well Number WS-11		Sheet 9 of 11	
Depth (feet, BGS)	Well Details	Interval Percent Recovery	Collection Method	Sample Data			Soil Description
				Number	Name (Type)	Blows/6"	
178		100%	CB		PID = 0.0		179.0 to 182.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 100% sand, medium, green and red lithics; wet.
179							
180							
181							
182							
183							
184							
185							
186							
187							
188		90%	CB		PID = 0.0		182.0 to 187.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine, red lithics; wet.
189							
190							
191							
192							
193							
194							
195							
196							
197							
198		40%	CB		PID = 0.0		187.0 to 188.0 feet: NO RECOVERY.
199							
200							
			GW		PID = 0.0		188.0 to 195.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine, red lithics; wet.
			GW		PID = 0.0		195.0 to 195.5 feet: SILT (ML); dark gray to greenish-gray; 95% fines, low plasticity; 5% sand, fine, sand in pockets; organic debris, roots, leaves; wet.
			GW		PID = 0.0		195.5 to 201.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red lithics; wet.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
10 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/ft		
201				GW		PID = 0.0			201.0 to 204.5 feet: SILTY GRAVEL (GM); dark gray, 15% fines, non plastic; 85% gravel, fine to coarse, subrounded to rounded; wet
202						PID = 0.0			
203									
204									
205						WS11-206.0			
206									
207									

Total Depth = 207.0 feet below ground surface.

WS11 Completion Details

Oregon Water Resources Department Well Start Card Number: W147655
Oregon Water Resources Department Well Identification Number: L67076

Boring

0.0 to 58.0 feet bgs: 9-inch temporary, threaded steel, isolation casing.
0.0 to 137.0 feet bgs: 8-inch temporary, threaded steel, isolation casing.
0.0 to 58.0 feet bgs: 7-inch temporary, threaded steel, isolation casing.
0.0 to 207.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
0.0 to 207.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.5 feet bgs: flush mount vault and cement seal.
1.5 to 5.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
5.0 to 102.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
102.0 to 104.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
106.0 to 124.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
124.0 to 126.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
126.0 to 139.0 feet bgs: bentonite grout slurry, 10.3 pounds per gallon.
139.0 to 140.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
161.0 to 207.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.

Well WS11-125

0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo Ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed
prior to well development.

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WATER RESOURCES DEPT
SALEM, OREGON

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.06

Well Number
WS-11

Sheet
11 of 11

Depth (feet, BGS)	Well Details	Sample Data			Soil Description		
Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/ft	Lithologic Column	

Well WS11-161:

0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.

145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped
screen, 0.010-slot

160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.



Approximate water level observed
prior to well development.

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WATER RESOURCES DEPT
SALEM, OREGON

Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction							
		Project Number 8128.01.08	Well Number WS-14	Sheet 1 of 11					
Project Name Siltronic Corporation Project Location 7200 NW Front Avenue Portland, Oregon Start/End Date 6/22/2004 to 7/9/2004 Driller/Equipment Boart Longyear/Rotosonic Geologist/Engineer ABC/EB Sample Method 4x6-inch core barrel.		TOC Elevation (feet) Surface Elevation (feet) 32.4 Northing 705183.4 Easting 7624486.1 Hole Depth 210.0-feet Outer Hole Diam 10.0 to 6.0-inch							
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			100	CB					0.0 to 1.3 feet: GRAVELLY SILT (ML); dark yellowish-brown; 70% fines, non plastic; 30% gravels, fine, subangular; trace organic debris; dry.
2						PID = 0ppm.			1.3 to 10.0 feet: SILTY SAND (SM); dark gray; 40-50% fines, low plasticity; 50-60% sand, fine; damp.
3									
4			80%	CB					@ 5.0-feet: Increased fines to 50%.
5						PID = 0ppm.			
6			95%	CB					
7									@ 9.5-feet: slight odor.
8						PID = 0ppm.			10.0 to 11.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; no noticeable odor; damp.
9									
10									11.0 to 14.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; trace gravels, fine to coarse; trace organic debris; slight odor; tarr-like balls; damp.
11			100	CB					
12									
13						PID = 0ppm.			14.0 to 16.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; trace organic debris; no noticeable odor; damp.
14									
15									
16			100	CB		PID = 0ppm.			16.0 to 18.5 feet: GRAVELLY SAND (SP); light grayish-brown; 70% sand, fine; 30% gravels, fine to medium, subangular; trace fines; damp.
17									
18									
19						PID = 0ppm.			18.5 to 22.0 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.
20									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo Ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed plastic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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WATER RESOURCES DEPT
SALEM, OREGON

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Maul Foster & Alongi, Inc.				Geologic Borehole Log/Well Construction					
				Project Number 8128.01.08		Well Number WS-14		Sheet 2 of 11	
Depth (feet, BGS)	Well Details	Interval Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description	
				Number	Name (Type)	Blows/6"			
21		100	CB						
22					PID = 0ppm.			22.0 to 22.5 feet: SILT (ML); light brownish-gray; 85% fines, low plasticity; 15% sand, fine; trace gravels, fine to medium, subrounded; trace organic debris; trace woody debris; damp.	
23								22.5 to 23.5 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.	
24		100	CB					23.5 to 26.0 feet: GRAVELLY SILT (ML); light grayish-brown; 65% fines, medium plasticity; 35% gravels, fine to coarse, subangular; trace sand; moist.	
25					PID = 0ppm.				
26		100	CB					26.0 to 29.0 feet: GRAVELLY SILT (ML); dark brownish-gray; 65% fines, medium plasticity; 35% gravels, fine to coarse, subangular; trace sand; strong sheen and odor; possible product; moist.	
27									
28					PID = 29.7ppm.				
29								29.0 to 33.0 feet: SANDY SILT (ML); dark brownish gray; 65% fines, low plasticity; 35% sand, fine; heavy sheen and odor; fatty-like impacts; possible product; moist.	
30									
31		100	CB		PID = 8.1ppm.				
32									
33					PID = 0ppm.			33.0 to 35.0 feet: SILTY SAND (SM); dark grayish-brown; 40% fines, low plasticity; 60% sand, fine; subrounded clast approximately 5-inches in diameter; heavy sheen and odor; moist.	
34									
35					PID = 0ppm.			35.0 to 35.5 feet: SAND (SP); light yellowish-brown; 100% sand, fine; trace fines, non plastic; heavy sheen and odor; moist.	
36		90	CB					35.5 to 38.5 feet: SAND (SP); dark brownish-gray; 100% sand, fine; trace fines, non plastic; heavy sheen and odor; globules; moist to wet.	
37									
38					PID = 0ppm.				
39								38.5 to 52.5 feet: SILTY SAND (SM); dark brownish-gray; 25% fines, non to low plasticity; 75% sand, fine; trace gravels, subangular; strong odor; wet.	
40									
41		100	CB		PID = 8ppm.				
42									

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NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
3 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Blows/ft	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)			
43									
44						PID = 0ppm.			
45									
46									
47						PID = 0ppm.			
48									
49									
50						PID = 0ppm.			
51									
52									
53						PID = 0ppm.			52.5 to 53.0 feet: SILT (ML); dark brownish-gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist to wet.
54									53.0 to 55.5 feet: SILTY SAND (SM); dark brownish-gray; 25% fines, non to low plasticity; 75% sand, fine; trace gravels, subangular; strong odor; wet.
55									
56						PID = 0ppm.			55.5 to 56.0 feet: SILT (ML); dark brownish-gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist to wet.
57		100	CB						56.0 to 58.0 feet: SAND WITH SILT (SP-SM); dark brownish-gray; 15% fines, non plastic; 85% sand, fine; strong odor; wet.
58									
59						PID = 0ppm.			58.0 to 66.0 feet: SILTY SAND (SM); dark brownish-gray; 15 to 20% fines, non to low plasticity; 75 to 80% sand, fine; trace cobbles, subrounded; strong odor; wet.
60									@ 60.0 feet: 3-inch silt layer.
61									
62		90	CB			PID = 0ppm.			
63									
64									@ 63.5.0 feet: odor becoming slight.
65									

NOTES:

1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = ground water sample, depth graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.
Geologic Borehole Log/Well Construction

 Project Number
 8128.01.08

 Well Number
 WS-14

 Sheet
 4 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/ft		
66						PID = 0ppm.			
67		100		CB					66.0 to 67.0 feet: SANDY SILT (ML); dark grayish-brown; 80% fines, non to low plasticity; 20% sand, fine; micaceous; moderate odor; moist to wet.
68						PID = 0ppm.			67.0 to 69.5 feet: SAND (SP); dark grayish-brown; 5% fines, non plastic; 95% sand, fine; micaceous; no noticeable odor; moist to wet.
69									@ 68.0 feet: 2-inch silt layer.
70									69.5 to 70.0 feet: SILT (ML); dark gray; 85% fines, low plasticity; 15% sand, fine; moist.
71		0		CB		PID = 0ppm. WS14-W-71			70.0 to 71.0 feet: SAND (SP); dark grayish-brown; 5% fines, non plastic; 95% sand, fine; micaceous; moist to wet.
72									71.0 to 75.5 feet: NO RECOVERY.
73									
74									
75									
76		100		CB		PID = 9.4ppm.			75.5 to 81.5 feet: SAND (SP); dark brownish-gray; trace to 5% fines, non plastic; 95 to 100% sand, fine; micaceous; slight odor; wet.
77									
78		100		CB		PID = 0ppm.			
79									@ 79.0 feet: trace silty balls.
80									
81						PID = 0ppm.			
82									81.5 to 82.5 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; slight odor; wet.
83									82.5 to 83.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; moderate odor; wet.
84						PID = 0ppm.			83.5 to 84.3 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; slight odor; wet.
85									84.3 to 84.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; moderate odor; wet.
86						WS14-W-86			84.5 to 85.0 feet: SAND and SILT (SP-ML); dark gray; alternating 1/4-inch to 1/2-inch sand and silt layers; wet.
87						PID = 0ppm.			85.0 to 87.5 feet: SAND (SP); dark gray; 10% fines, non plastic; 90% sand, fine; micaceous; odor; wet.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GWS = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

JAN 23 2015

WATER RESOURCES DEPT

SALEM, OREGON

Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction						
		Project Number 8128.01.08		Well Number WS-14		Sheet 5 of 11		
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data		Blows/6"	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)		
88			100	CB				87.5 to 88.0 feet: SANDY SILT (ML); gray; 60% fines, low to medium plasticity; 40% sand, fine; micaceous; moderate odor; wet.
89								88.0 to 89.5 feet: SILTY SAND (SM); gray; 15% fines, non plastic; 85% sand, fine; micaceous; slight odor; wet.
90						PID = 13ppm		89.5 to 90.5 feet: SILT (ML); dark gray; 100% fines, medium plasticity; trace sand, fine; micaceous; moist.
91								90.5 to 92.0 feet: SILTY SAND (SM); gray; 15% fines, non plastic; 85% sand, fine; micaceous; sheen and strong odor; wet.
92								92.0 to 96.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand, fine; micaceous; sheen and strong odor; moist. Several zones of 2-inch pockets with fine sand.
93						PID = 28.3ppm		
94								
95								
96			100	CB		PID = 0ppm.		96.0 to 98.0 feet: SANDY SILT (ML); dark gray; 85% fines, medium plasticity; 15% sand, fine; micaceous; strong odor; moist.
97								
98								98.0 to 102.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; strong odor; wet. Between 99.0 and 99.5 feet several 1/2-inch silt bands intermixed with sand.
99						PID = 0ppm.		
100								@ 100.5 feet: 1-inch silt layer.
101						WS14-W-101		
102			100	CB		PID = 0ppm.		102.0 to 105.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; sheen and strong odor; wet.
103								
104								
105						PID = 84ppm		105.0 to 105.5 feet: SILT (ML); gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist.
106								105.5 to 106.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; sheen and strong odor; wet.
107								106.0 to 108.0 feet: SILT (ML); gray; 100% fines; low plasticity; trace sand, fine; trace rootlets; moderate odor; moist.
108								@ 107.0 feet: 2-inch gray sand layer with strong odor.
109						PID = 9.5ppm		108.0 to 108.5 feet: SILTY SAND (SM); gray; 30% fines, low plasticity; 70% sand, fine; sheen and strong odor; wet.
110								108.5 to 110.5 feet: SILT (ML); gray; 100% fines; low plasticity; trace sand, fine; sheen and strong odor; moist.
								@ 109.0 feet: 4-inch silty sand layer with sheen and strong odor.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of non-hydrocarbon petroleum waste.

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WATER RESOURCES DEPT
CLACKAMAS COUNTY

Maul Foster & Alongi, Inc.				Geologic Borehole Log/Well Construction				
				Project Number 8128.01.08		Well Number WS-14		Sheet 6 of 11
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Soil Description
					Number	Name (Type)	Blows/6"	
111		100	CB		PID = 0ppm.			110.5 to 111.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; slight odor, wet. 111.0 to 113.0 feet: NO RECOVERY; stuff.
112								
113					PID = 0ppm.			113.0 to 114.0 feet: SANDY SILT (ML); dark brownish-gray; 60% fines, non to low plasticity; 40% sand, fine; micaceous; faint odor, moist to wet.
114								114.0 to 120.5 feet: SAND (SP); dark brownish-gray; 5% fines, non plastic; 95% sand, fine; micaceous; no noticeable odor, wet.
115								
116					PID = 0ppm.			@ 116.0 feet: 3-inch silt layer.
117								
118								
119					PID = 0ppm.			
120					WS14-W-120			
121		100	CB					120.5 to 121.0 feet: SILT (ML); dark brownish-gray; 85% fines, low plasticity; 15% sand, fine; micaceous; moist.
122								121.0 to 132.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.
123								
124					PID = 0ppm.			@ 124 feet: sheen and strong odor present.
125								
126								
127					PID = 0ppm.			
128								
129								
130					PID = 0ppm.			@ 130 feet: sheen and strong odor fading.
131								
132								

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WATER RESOURCES DEPT
SALEM, OREGON

NOTES: 1. CB = 4x8-inch core barrel soil sampler. 2. PID = Photo Ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

GBLWC W:\GINT\GINT\PROJECTS\8128-01\WS14-17.GPJ 4/13/07

Geologic Borehole Log/Well Construction									
Maul Foster & Alongi, Inc.			Project Number 8128.01.08		Well Number WS-14		Sheet 7 of 11		
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data		Blows/ft*	Lithologic Column	Soil Description	
				Number	Name (Type)				
133					PID = 0ppm.			132.5 to 133.5 feet: SILT (ML); dark grayish-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.	
134								133.5 to 134.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.	
135								134.0 to 134.5 feet: SILT (ML); dark grayish-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.	
136		0	CB					134.5 to 136.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.	
137								@ 135.5 feet: 3-inch silt layer.	
138								136.0 to 138.5 feet: NO RECOVERY.	
139		100	CB		PID = 0ppm.			138.5 to 141.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; slight odor; wet.	
140									
141									
142		100	CB		PID = 0ppm. WS14-W-142			141.5 to 142.0 feet: SILT (ML); dark brownish-gray; 85% fines, low plasticity; 15% sand, fine; micaceous; moist.	
143								@ 141.7 feet: 1-inch sand layer.	
144								142.0 to 143.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.	
145					PID = 0ppm.			143.0 to 145.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand; moist.	
146								@ 143.5 feet: 3-inch sand layer.	
147									
148									
149					PID = 0ppm.			145.0 to 148.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; intermixed with 1-inch to 2-inch sand layers; moist.	
150		100	CB		WS14-W-150			148.5 to 149.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.	
151								149.0 to 149.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand; moist.	
152					PID = 0ppm.			149.5 to 150.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.	
153								150.0 to 167.0 feet: SAND (SP); gray; 5% fines, non plastic; 95% sand, fine to medium; trace wood debris; wet.	
154								@ 152.0 feet: 2-inch silt layer.	
155									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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WATER RESOURCES DEPT
SALEM, OREGON

Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction							
		Project Number 8128.01.08		Well Number WS-14		Sheet 8 of 11			
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Blows/6"	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)			
156						PID = 0ppm.			@ 155.0 feet: Wood fragments.
157									@ 157.0 feet: 3-inch silt layer.
158						PID = 0ppm.			
159									
160									
161						PID = 0ppm.			
162									
163									
164						PID = 0ppm.			
165									
166									
167						PID = 0ppm.			
168		100		CB		PID = 0ppm. WS14-W-167			167.0 to 167.5 feet: NO RECOVERY; silt.
169									167.5 to 169.5 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
170						PID = 0ppm.			169.5 to 172.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; increasing fines to 15%; wet.
171									
172									172.0 to 173.0 feet: SILTY SAND (SM); gray; 35% fines, non plastic; 65% sand, fine; wet.
173						PID = 0ppm.			173.0 to 182.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
174									
175									
176						PID = 0ppm.			
177		100		CB					

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SALEM, OREGON

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo Ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

GBLWC W\GINTGINT\PROJECTS\8128-01\WS14-17.GPJ 4/13/07

Maul Foster & Alongi, Inc.			Geologic Borehole Log/Well Construction						
			Project Number 8128.01.08			Well Number WS-14		Sheet 9 of 11	
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
178									
179						PID = 0ppm.			
180									
181									
182		80	CB			PID = 0ppm. WS14-W-182			182.0 to 185.5 feet: NO RECOVERY; sluff.
183									
184									
185									
186						PID = 0ppm.			185.5 to 186.5 feet: Sand (SP); gray; 100 % sand, fine, micaceous; trace fines; wet.
187									186.5 to 188.0 feet: SILTY SAND (SM); gray; 35% fines, low plasticity; 65% sand, fine; wet.
188									
189						PID = 0ppm.			188.0 to 190.0 feet: SILT (ML); gray; 100% fines, low to medium plasticity; damp. @ 189.0 feet: 2-inch fine, sand layer.
190									
191									190.0 to 195.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
192		100	CB			PID = 0ppm.			
193									
194									
195						PID = 0ppm.			195.0 to 196.0 feet: SILTY SAND (SM); gray; 50% fines, low plasticity; 50% sand, fine; wet.
196									196.0 to 197.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
197		90	CB			WS14-W-197			197.0 to 198.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; damp.
198						PID = 0ppm.			198.0 to 204.0 feet: SAND (SP); gray; 100% sand, fine to medium; micaceous; trace fines; wet.
199									
200									

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NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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SALEM, OREGON

Maul Foster & Alongi, Inc.			Geologic Borehole Log/Well Construction						
			Project Number 8128.01.08		Well Number WS-14		Sheet 10 of 11		
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data		Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)			
201						PID = 0ppm.			
202									
203									
204						PID = 0ppm.			204.0 to 208.0 feet: GRAVEL with SILT (GW-GM); gray; 15% fines, non plastic; 85% gravels, fine to coarse, subangular to subrounded; wet.
205									
206									
207									
208									
209						WS14-W-208			208.0 to 210.0 feet: BASALT; light gray to dark gray; moist to wet; bedrock. (Columbia River Basalt Group) Significant increase in resistance, drilling hardness.
210									
Total Depth = 210.0 feet.									
<p>WS14 Completion Details</p> <p>Oregon Water Resources Department Well Start Card Number: 164731 Oregon Water Resources Department Well Identification Number: L67967</p> <p>Boring: 0.0 to 69.0 feet bgs: 10-inch temporary, threaded steel, isolation casing. 0.0 to 110.0 feet bgs: 9-inch temporary, threaded steel, isolation casing. 0.0 to 135.0 feet bgs: 8-inch temporary, threaded steel, isolation casing. 0.0 to 210.0 feet bgs: 6-inch temporary, threaded steel, isolation casing. 0.0 to 210.0 feet bgs: 4x6-inch core barrel sampler.</p> <p>0.0 to 1.5 feet bgs: flush mount vault and cement seal. 1.5 to 7.0 feet bgs: 1/4-inch Baroid bentonite chips hydrated with potable water. 7.0 to 104.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon. 104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack. 106.0 to 125.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack. 125.0 to 140.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water. 140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack. 142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack. 161.0 to 210.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.</p>									
<p>NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector; soil head space reading in parts per million. 3. BGS = below ground surface. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.</p>									

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WATER RESOURCES
SALE, OREGON

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 8128.01.08	Well Number WS-14	Sheet 11 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data		Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)			

Well WS14-125:

0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.

109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.

124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

Well WS14-161:

0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.

145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.

160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

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WATER RESOURCES DEPT
SALEM, OREGON

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

ATTACHMENT C

OWRD WELL LOGS



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**WATER RESOURCES DEPT
SALEM, OREGON**

MULT 72126
Pag MULT 72126 04 LG 076
Start Card # W147655

Start Card # W 147655

(6) LOCATION OF WELL By legal description
Well Location: County Butterworth
Township 1N (N or S) Range 14W (E or W) Section 13
1. SW 1/4 of SW 1/4 of above section.
2. Either Street address of well location 2200 N.W. Front
Ave. Portland, Or.
or Tax lot number of well location 1200
3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include
approximate scale and north arrow.

(7) STATIC WATER LEVEL:
22.9 Ft. below land surface. Date 10-20-03
Artesian Pressure _____ lb/sq. in. Date _____

(8) WATER BEARING ZONES:

Depth at which water was first found _____			
From	To	Est. Flow Rate	SWL
145	160	.75	27.9

(9) WELL LOG:

[illegible]

Date started _____ Completed 10-21-03

(5) WELLTEST:

☒ Pump ☐ Bailor ☐ Air ☐ Flowing Artesian
Permeability _____ Yield 7.5 GPM
Conductivity 4.5 / us/cm PH 6.61
Temperature of water 15.27 °F ☒ Depth artesian flow found _____ ft.
Was water analysis done? ☐ Yes ☒ No
By whom? _____
Depth of strata to be analyzed. From _____ ft. to _____ ft.
Remarks:

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

Signed _____ Date _____

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

Name of supervising Geologist/Engineer Man. Foster & Alongi
ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT

Signed _____ Date SALEM OREGON
 SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

Willamette River

MULT 72126
MULT 72126

Security Gate

I.D. #L67100

I.D. #L67076

WS 12

WS 11

Parking Lot #1

Parking Lot #2

Security Gate

I.D. #L67091

WS 13

WS 10
ID L64996

Hydrogen tank

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DEC 10 2003

WATER RESOURCES DEPT
SALEM, OREGON

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WATER RESOURCES DEPT
SALEM, OREGON



MULT 72126



Oregon

Theodore R. Kulongoski, Governor

Water Resources Department

Commerce Building
158 12th Street NE
Salem, OR 97301-4172
503-378-3739
FAX 503-378-8130

September 2, 2003

MARK KNOLLE #10437
C/O PROSONIC CORP
305 E. COMSTOCK DR
CHANDLER AZ 85225

FINAL ORDER

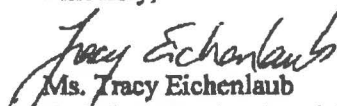
Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card numbers 147653-147655 is approved for the following: multiple completion wells, the wells will have two (2) 2 inch wells in each borehole. See Oregon Administrative Rule (OAR) 690-240-0410(5). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 378-8455 ext 283, or by e-mail at tracy.l.eichenlaub@wrд.state.or.us.

Sincerely,


Ms. Tracy Eichenlaub
Well Construction Specialist
Enforcement Section

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137.004-0080 and OAR 690-01-0005 you may either petition for judicial review or petition the Director for reconsideration of this order.

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JAN 23 2015

**WATER RESOURCES DEPT
SALEM, OREGON**

MULT 72126

**Water Resources Department**

Commerce Building
158 12th Street NE
Salem, OR 97301-4172
503-378-3739
FAX 503-378-8130

October 6, 2003

MARK KNOLLE #10437
C/O PROSONIC CORP
305 E. COMSTOCK DR
CHANDLER AZ 85225

FINAL ORDER

Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card number 147655 is approved for the following: use of bentonite below 50 feet and through more than 25 feet of water, 3/8 inch bentonite pellets will be used to abandon the bottom of the hole from 206 feet to 160 feet. See Oregon Administrative Rule (OAR) 690-240-0475(3). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 986-0851, or by e-mail at tracy.l.eichenlaub@wrdd.state.or.us.

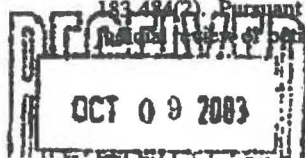
Sincerely,

Tracy Eichenlaub
Ms. Tracy Eichenlaub
Well Construction Specialist
Enforcement Section

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

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WATER RESOURCES DEPT
SALEM, OREGON

STATE OF OREGON
MONITORING WELL REPORT
(as required by ORS 537.765 & OAR 690-240-045)

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT: WELL NO. W-13
Name Bill Tronic Corporation
Address 7200 NW Front Ave.
City Portland State OR Zip 97210

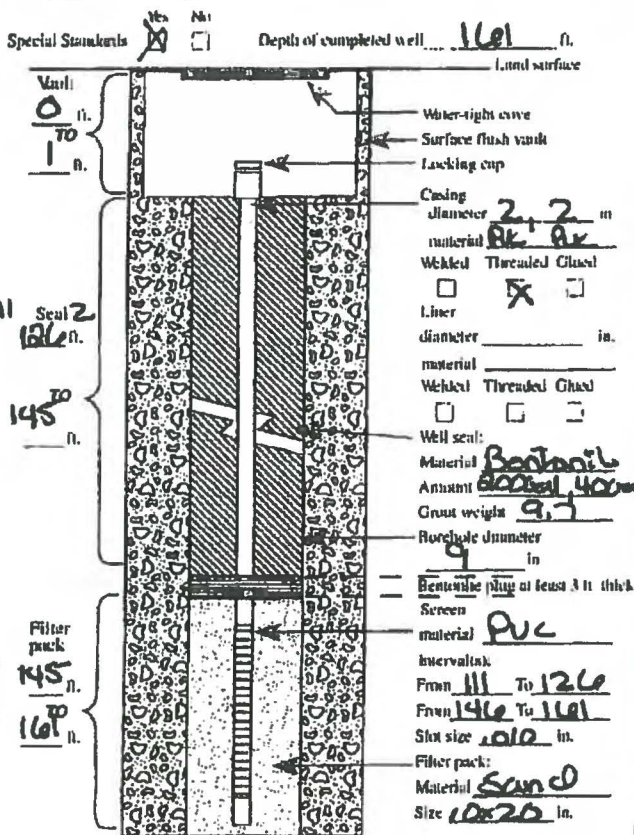
(2) TYPE OF WORK:

- ☒ New construction ☐ Alteration (Repair/Recondition)
☐ Conversion ☐ Deepening ☐ Abandonment

(3) DRILLING METHOD

- ☐ Rotary Air ☐ Rotary Mud ☐ Cable
☐ Hollow Stem Auger ☒ Other Sonic

(4) BORE HOLE CONSTRUCTION



(5) WELL TEST:

- ☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
Permeability _____ Yield _____ GPM
Conductivity _____ PH _____
Temperature of water _____ At _____ depth artesian flow found _____ ft.
Was water analysis done? NO
By whom? NOT
Depth of strata to be analyzed NOT ft.
Remarks: NOT

Name of supervising Geologist/Engineer _____

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT

(6) LOCATION OF WELL By legal description

Well Location: County Multnomah
Township 1 (N or S) Range 1 (E or W) Section 13
1. NW 1/4 NW 1/4 of above section.
2. Either: Street address of well location 7200 NW Front Ave

or Tax lot number of well location 1200

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL:

NOT OBSERVED
Artesian Pressure _____ ft. in _____ Date _____

(8) WATER BEARING ZONES:

Depth at which water was first found _____

From	To	Est. Flow Rate	SWL
NOT OBSERVED			

(9) WELL LOG:

Ground elevation _____

Material	From	To	SWL
<u>Sanct Grounds</u>	<u>0</u>	<u>40</u>	
<u>Gravel</u>	<u>40</u>	<u>204</u>	
<u>Basalt</u>	<u>204</u>	<u>204</u>	
<u>Neat Well Special Standard Request on file.</u>			
<u>Drilled well to 204' back-filled with bentonite from 204' to 1161'</u>			
<u>Bentonite</u>	<u>1161</u>	<u>204</u>	
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Date started 10/27/04 Completed 7/18/07

(unbonded) Monitor Well Constructor Certification.

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Makings used and information reported above are true to the best knowledge and belief.

Signed Michael J. Stieber MWC Number 10570
Date 7/12/07

(bonded) Monitor Well Constructor Certification.

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

Signed Michael J. Stieber MWC Number 10570
Date 7/12/07

SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

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WATER RESOURCES DEPT
SALEM, OREGON

Willamette River

I.D. #L67100

I.D. L67076

WS 12

WS 11

I.D. L67091

WS 13

WS 14

Security Gate

Parking Lot #1

Parking Lot #2

WS 10
ID L64996

Hydrogen Tank

MULT 73686

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INSTRUCTOR THIRD COPY CUSTOMER

WATER RESOURCES DEPT
SALEM, OREGON

Kerry Gallagher

From: BAYUK Dana <BAYUK.Dana@deq.state.or.us>
Sent: Tuesday, January 28, 2014 9:19 AM
To: James Peale
Cc: Burr, Myron; Gladstone, Alan; Church, Brian (BCHURCH@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); Earle, William G. (WEARLE@davisrothwell.com); Kerry Gallagher; BYRD Kristopher R; LARSEN Henning
Subject: RE: Siltronic - Conversation Confirmation

Good morning James.

This e-mail confirms that during our telephone conversation yesterday I informed you that Siltronic Corporation should prepare a plan for abandoning monitoring well WS-14-161. The screen and sand pack interval of this monitoring well penetrates through the "deep aquitard" identified beneath the Siltronic property. The appearance of dense-non aqueous phase liquid (DNAPL) in the monitoring well indicates the installation is acting as a pathway for contamination to migrate vertically downward through the deep aquitard into deeper intervals of the Alluvium water-bearing zone.

As I indicated during yesterday's call, based on the information summarized above DEQ has determined that abandonment of WS-14-161 is required under the TCE Order (DEQ No. VC-NWR-03-16). Abandonment of WS-14-161 should be conducted consistent with OAR-690-240 and previously approved protocols for abandoning monitoring wells at the Gasco and Siltronic sites (e.g., use of organoclay-bentonite sealant).

Previous work at the adjoining Gasco Site identified potential causes for DNAPL to appear in monitoring wells including: 1) migration of DNAPL to the monitoring well location; and/or 2) vertical migration of DNAPL down the borehole due to failure of the monitoring well seal. Siltronic should assess the cause of DNAPL appearance in WS-14-161 by videoing the inside of the 2-inch monitoring well casing and screen prior to abandonment and, to the extent practicable documenting visual evidence of the depth of DNAPL occurrence during abandonment.

As indicated in your e-mail, Siltronic should submit the abandonment plan for WS-14-161 on or before February 14, 2014.

Please don't hesitate to contact me with questions regarding this e-mail.

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201
E-mail: bayuk.dana@deq.state.or.us
Phone: 503-229-5543
FAX: 503-229-6899

Please visit our website at <http://www.oregon.gov/DEQ/>



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From: James Peale [<mailto:jpeale@maulfoster.com>]
Sent: Monday, January 27, 2014 4:50 PM
To: BAYUK Dana
Cc: Burr, Myron; Gladstone, Alan; Church, Brian (BCHURCH@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); Earle, William G. (WEARLE@davisrothwell.com); Kerry Gallagher
Subject: Siltronic - Conversation Confirmation

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WATER RESOURCES DEPT
SALEM, OREGON

Dana –

This email is provided as a continuation to our conversation of this morning. For the purposes of documentation, Siltronic requires DEQ's email confirmation that DEQ has directed Siltronic to submit a workplan for the abandonment of nested wells WS-14-125 and WS-14-161. The workplan is due February 14, 2014. Please also confirm that the workplan should describe abandonment consistent with WRD regulations (e.g., OAR 690-220 Abandonment of Wells).

MFA is prepared to submit the workplan consistent with these requirements. Please note that if the workplan is approved, Siltronic will require written direction from DEQ in order to proceed with the abandonment.

Thanks in advance, Dana.

jp

JAMES G.D. PEALE RG, LHG | MAUL FOSTER ALONGI

d. 503 501 5218 | p. 971 544 2139 | c. 503 449 9576 | f. 971 544 2140 | www.maulfooster.com
2001 NW 19th Avenue, Suite 200, Portland, OR 97209

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JAN 23 2015

**WATER RESOURCES DEPT
SALEM, OREGON**

From: BAYUK Dana
To: Kerry Gallagher
Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake, Sean@epamail.epa.gov; Fuentes, Rene@epamail.epa.gov; Peterson, Lance (PetersonLF@cdmsmith.com); pdost@pearlegalgroup.com; John Edwards (jedwards@anchoragea.com); Carl Stivers (cstivers@anchoragea.com); riw@nwnatural.com; Rob Ede (robe@hahnenv.com); BYRD Kristopher R; GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP
Date: Thursday, April 10, 2014 5:42:12 PM

Good afternoon Kerry.

DEQ reviewed the "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, Portland, OR - ECSI No. 183" dated February 14, 2014 (Abandonment Plan). As we discussed by telephone the Abandonment Plan provides insufficient information regarding decommissioning procedures, particularly with respect to over-drilling and removing monitoring well construction materials.

As requested by DEQ, the Abandonment Plan includes a task to video log the WS-14-125/161 monitoring wells before they are decommissioned. During telephone discussions we concluded the video log could provide useful information for developing the approach to decommissioning the two installations. Based on this conclusion, DEQ verbally approved Siltronic moving forward with video logging. This e-mail provides DEQ's written approval for Siltronic to proceed with the video logs of WS-14-125/161.

DEQ understands video logging will be conducted on April 11, 2014. DEQ requests that three copies of the log be provided on disc for our information and use. This e-mail also acknowledges that you notified me of the work and schedule during our phone discussion on April 3rd.

Please feel free to contact me with questions regarding this e-mail.

Dana

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201
E-mail: bayuk.dana@deq.state.or.us
Phone: 503-229-5543
FAX: 503-229-6899

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From: Kerry Gallagher [<mailto:kgallagher@maulfoster.com>]

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**WATER RESOURCES DEPT
SALEM, OREGON**

Sent: Friday, February 14, 2014 3:58 PM

To: BAYUK Dana

Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sea@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorqea.com); Carl Stivers (cstivers@anchorqea.com); rjw@nwnatural.com; Rob Ede (robe@hahnenv.com); GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: Siltronic: Monitoring Well WS-14 Abandonment WP

Dana,

As requested, please find the attached Monitoring Well WS-14 Abandonment Work Plan for your review and approval. The required hard copies of this submittal will follow by mail.

Please call or email if you have any questions. Thank you,

KERRY-CATHLIN GALLAGHER | MAUL FOSTER & ALONGI, INC.

direct. 503 501 5229 | main office. 971 544 2139 | cell. 503 896 0255 | fax. 971 544 2140 | www.maulfooster.com
2001 NW 19th Avenue, Suite 200, Portland, Oregon 97209

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**WATER RESOURCES DEPT
SALEM, OREGON**

Kerry Gallagher

From: BAYUK Dana <BAYUK.Dana@deq.state.or.us>
Sent: Wednesday, June 25, 2014 4:38 PM
To: 'Burr, Myron (Myron.Burr@siltronic.com)'
Cc: 'Gladstone, Alan (AGLADSTONE@davisrothwell.com)'; James Peale; Kerry Gallagher; Bob Wyatt; Patty Dost; 'John Edwards (jedwards@anchorqea.com)'; 'Ben Hung'; John Renda; Rob Ede; 'Sheldrake, Sean'; Mullin, Jeanette; 'Peterson, Lance (PetersonLE@cdmsmith.com)'; Coffey, Scott; BYRD Kristopher R; JOHNSON Keith; GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP

Good afternoon Myron.

Consistent with DEQ's April 10, 2014 e-mail (see below), Siltronic Corporation (Siltronic) completed video logging of monitoring wells WS-14-125 and WS-14-161 on April 14, 2014. DEQ reviewed the video logs and concludes that dense non-aqueous phase liquids (DNAPLs) are entering the monitoring well screens and sand-packed intervals of both installations. These two monitoring wells are constructed in a single borehole and together are designated "WS-14-125/161."

In addition, as indicated in our May 20, 2014 letter commenting on the Phase 1-Step 4 Report (see footnote), DEQ concludes the screen and sand-packed intervals of monitoring wells WS-11-161 and WS-14-161 penetrate the deep aquitard and hydraulically connect the upper lower Alluvium water-bearing zone (WBZ) and the deep lower Alluvium WBZ.

Monitoring well WS-11-161 is collocated with WS-11-125 in a single borehole and the two wells together are designated "WS-11-125/161." Groundwater contamination is documented in both of these monitoring wells.

Based on the information summarized above, DEQ further concludes that:

- Monitoring wells WS-14-125 and WS-14-161 represent potential pathways for DNAPLs to migrate vertically downward into deeper intervals of the upper lower Alluvium WBZ and deep lower Alluvium WBZ; and
- Monitoring well WS-11-161 represents a potential pathway for groundwater contamination in the upper lower Alluvium WBZ to migrate vertically downward into the deep lower Alluvium WBZ.

DEQ requires that WS-11-125/161 and WS-14-125/161 be permanently abandoned through over drilling and removal consistent with OAR 690-290-0510. Siltronic should prepare and submit a work plan for this purpose for DEQ's review within 30-days of receiving this e-mail.

DEQ acknowledges and appreciates the video logs of WS-14-125/161. The logs were very useful for determining the status of the installations. Please don't hesitate to contact me with questions regarding this e-mail.

Dana

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201
E-mail: bayuk.dana@deq.state.or.us
Phone: 503-229-5543
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Footnote. Anchor QEA, LLC, 2014, "Data Report: Groundwater Source Control Extraction System Test - Phase 1 Step 4 - NW Natural Gasco Site," April 10, a report prepared for NW Natural.

From: BAYUK Dana

Sent: Thursday, April 10, 2014 5:41 PM

To: 'Kerry Gallagher'

Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorqea.com); Carl Stivers (cstivers@anchorqea.com); rjw@nwnatural.com; Rob Ede (robe@hahnenenv.com); BYRD Kristopher R; GAINER Tom; LARSEN Henning; MCCLINCY Matt

Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP

Good afternoon Kerry.

DEQ reviewed the "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, Portland, OR - ECSI No. 183" dated February 14, 2014 (Abandonment Plan). As we discussed by telephone the Abandonment Plan provides insufficient information regarding decommissioning procedures, particularly with respect to over-drilling and removing monitoring well construction materials.

As requested by DEQ, the Abandonment Plan includes a task to video log the WS-14-125/161 monitoring wells before they are decommissioned. During telephone discussions we concluded the video log could provide useful information for developing the approach to decommissioning the two installations. Based on this conclusion, DEQ verbally approved Siltronic moving forward with video logging. This e-mail provides DEQ's written approval for Siltronic to proceed with the video logs of WS-14-125/161.

DEQ understands video logging will be conducted on April 11, 2014. DEQ requests that three copies of the log be provided on disc for our information and use. This e-mail also acknowledges that you notified me of the work and schedule during our phone discussion on April 3rd.

Please feel free to contact me with questions regarding this e-mail.

Dana

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201
E-mail: bayuk.dana@deq.state.or.us
Phone: 503-229-5543
FAX: 503-229-6899

Please visit our website at <http://www.oregon.gov/DEQ/>



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From: Kerry Gallagher [<mailto:kgallagher@maulfoster.com>]

Sent: Friday, February 14, 2014 3:58 PM

To: BAYUK Dana

Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church,

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**WATER RESOURCES DEPT
SALEM, OREGON**

Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchoragea.com); Carl Stivers (cstivers@anchoragea.com); rjw@nwnatural.com; Rob Ede (robe@hahnenv.com); GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: Siltronic: Monitoring Well WS-14 Abandonment WP

Dana,

As requested, please find the attached Monitoring Well WS-14 Abandonment Work Plan for your review and approval. The required hard copies of this submittal will follow by mail.

Please call or email if you have any questions. Thank you,

KERRY-CATHLIN GALLAGHER | MAUL FOSTER & ALONGI, INC.

direct. 503 501 5229 | main office. 971 544 2139 | cell. 503 896 0255 | fax. 971 544 2140 | www.maulfooster.com
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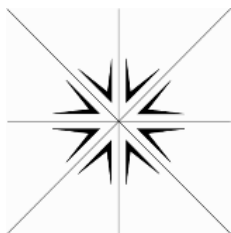
JAN 23 2015

WATER RESOURCES DEPT
SALEM, OREGON

ATTACHMENT C

LABORATORY ANALYTICAL REPORTS





Specialty Analytical

11711 SE Capps Road, Ste B
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

February 25, 2015

James Peale
Maul Foster & Alongi
400 E. Mill Plain Blvd.
Suite 400
Vancouver, WA 98660
TEL: (360) 694-2691
FAX (360) 906-1958
RE: Siltronic IDW / 8128.01.08/08

Dear James Peale:

Order No.: 1502126

Specialty Analytical received 2 sample(s) on 2/11/2015 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read "Marty French".

Marty French
Lab Director

Specialty Analytical

Date Reported: 25-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic IDW / 8128.01.08/08
Lab ID: 1502126-001
Client Sample ID: DRUMS-SO-10-36

Collection Date: 2/11/2015 11:15:00 AM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
NWTPH-DX		NWTPH-DX				Analyst: BS
Diesel	71.6	20.9	A1	mg/Kg-dry	1	2/17/2015 9:38:09 AM
Lube Oil	ND	69.8		mg/Kg-dry	1	2/17/2015 9:38:09 AM
Surr: o-Terphenyl	52.5	50-150		%REC	1	2/17/2015 9:38:09 AM
NWTPH-GX		NWTPH-GX				Analyst: BS
Gasoline	21.3	3.49		mg/Kg-dry	1	2/19/2015 11:29:03 AM
Surr: 4-Bromofluorobenzene	61.0	50-150		%REC	1	2/19/2015 11:29:03 AM
TCLP 8 ICP/MS METALS-TCLP LEACHED		E1311/6020				Analyst: KP
Arsenic, TCLP	ND	6.98		µg/L	1	2/19/2015 5:12:00 PM
Barium, TCLP	457	69.8		µg/L	1	2/19/2015 5:12:00 PM
Cadmium, TCLP	ND	6.98		µg/L	1	2/19/2015 5:12:00 PM
Chromium, TCLP	ND	6.98		µg/L	1	2/19/2015 5:12:00 PM
Lead, TCLP	ND	6.98		µg/L	1	2/19/2015 5:12:00 PM
Selenium, TCLP	ND	69.8		µg/L	1	2/19/2015 5:12:00 PM
Silver, TCLP	ND	6.98		µg/L	1	2/19/2015 5:12:00 PM
TCLP 8 TOTAL MERCURY		E7470A				Analyst: BW
Mercury, TCLP	ND	0.000100		mg/L	1	2/17/2015 3:00:09 PM
SEMIVOLATILE ORGANICS-LOW LEVEL		SW8270D				Analyst: bda
1,2,4-Trichlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
1,2-Dichlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
1,2-Diphenylhydrazine	ND	167		µg/Kg	1	2/18/2015 12:04:00 PM
1,3-Dichlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
1,4-Dichlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
1-Methylnaphthalene	452	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
2,4,5-Trichlorophenol	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
2,4,6-Trichlorophenol	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
2,4-Dichlorophenol	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
2,4-Dimethylphenol	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
2,4-Dinitrophenol	ND	333		µg/Kg	1	2/18/2015 12:04:00 PM
2,4-Dinitrotoluene	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
2,6-Dinitrotoluene	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
2-Chloronaphthalene	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
2-Chlorophenol	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
2-Methylnaphthalene	623	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
2-Methylphenol	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
2-Nitroaniline	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM

Specialty Analytical

Date Reported: 25-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic IDW / 8128.01.08/08
Lab ID: 1502126-001
Client Sample ID: DRUMS-SO-10-36

Collection Date: 2/11/2015 11:15:00 AM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL		SW8270D				Analyst: bda
2-Nitrophenol	ND	167		µg/Kg	1	2/18/2015 12:04:00 PM
3-&4-Methylphenol	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
3,3-Dichlorobenzidine	ND	167		µg/Kg	1	2/18/2015 12:04:00 PM
3-Nitroaniline	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
4,6-Dinitro-2-methylphenol	ND	167		µg/Kg	1	2/18/2015 12:04:00 PM
4-Bromophenyl phenyl ether	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
4-Chloro-3-methylphenol	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
4-Chloroaniline	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
4-Chlorophenyl phenyl ether	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
4-Nitroaniline	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
4-Nitrophenol	ND	167		µg/Kg	1	2/18/2015 12:04:00 PM
Acenaphthene	1600	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Acenaphthylene	88.3	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Aniline	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Anthracene	658	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Benz(a)anthracene	686	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Benzidine	ND	167		µg/Kg	1	2/18/2015 12:04:00 PM
Benzo(a)pyrene	888	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Benzo(b)fluoranthene	796	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Benzo(g,h,i)perylene	870	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Benzo(k)fluoranthene	300	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Benzoic Acid	ND	667		µg/Kg	1	2/18/2015 12:04:00 PM
Benzyl Alcohol	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Benzyl butyl phthalate	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Bis(2-chloroethoxy)methane	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Bis(2-chloroethyl)ether	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Bis(2-chloroisopropyl)ether	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Bis(2-ethylhexyl)phthalate	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Carbazole	113	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Chrysene	697	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Dibenz(a,h)anthracene	160	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Dibenzofuran	72.3	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Diethyl phthalate	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Dimethyl phthalate	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Di-n-butyl phthalate	ND	50.0		µg/Kg	1	2/18/2015 12:04:00 PM
Di-n-octyl phthalate	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Fluoranthene	1680	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Fluorene	569	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Hexachlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM

Specialty Analytical

Date Reported: 25-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic IDW / 8128.01.08/08
Lab ID: 1502126-001
Client Sample ID: DRUMS-SO-10-36

Collection Date: 2/11/2015 11:15:00 AM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL		SW8270D				Analyst: bda
Hexachlorobutadiene	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Hexachlorocyclopentadiene	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Hexachloroethane	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Indeno(1,2,3-cd)pyrene	630	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Isophorone	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Naphthalene	1030	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Nitrobenzene	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
N-Nitrosodimethylamine	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
N-Nitrosodi-n-propylamine	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
N-Nitrosodiphenylamine	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Pentachlorophenol	ND	50.0		µg/Kg	1	2/18/2015 12:04:00 PM
Phenanthrene	3130	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Phenol	ND	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Pyrene	3000	33.3		µg/Kg	1	2/18/2015 12:04:00 PM
Pyridine	ND	167		µg/Kg	1	2/18/2015 12:04:00 PM
Surr: 2,4,6-Tribromophenol	54.4	57.8-119	S	%REC	1	2/18/2015 12:04:00 PM
Surr: 2-Fluorobiphenyl	66.2	52.6-93.2		%REC	1	2/18/2015 12:04:00 PM
Surr: 2-Fluorophenol	123	40.7-111	S	%REC	1	2/18/2015 12:04:00 PM
Surr: 4-Terphenyl-d14	136	49.8-118	S	%REC	1	2/18/2015 12:04:00 PM
Surr: Nitrobenzene-d5	100	44.8-103		%REC	1	2/18/2015 12:04:00 PM
Surr: Phenol-d6	115	47.5-117		%REC	1	2/18/2015 12:04:00 PM
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: CK
1,1,1,2-Tetrachloroethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,1,1-Trichloroethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,1,2,2-Tetrachloroethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,1,2-Trichloroethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,1-Dichloroethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,1-Dichloroethene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,1-Dichloropropene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,2,3-Trichlorobenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,2,3-Trichloropropane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,2,4-Trichlorobenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,2,4-Trimethylbenzene	14.2	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,2-Dibromo-3-chloropropane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,2-Dibromoethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,2-Dichlorobenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,2-Dichloroethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM

Specialty Analytical

Date Reported: 25-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic IDW / 8128.01.08/08
Lab ID: 1502126-001
Client Sample ID: DRUMS-SO-10-36

Collection Date: 2/11/2015 11:15:00 AM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: CK
1,2-Dichloropropane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,3,5-Trimethylbenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,3-Dichlorobenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,3-Dichloropropane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
1,4-Dichlorobenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
2,2-Dichloropropane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
2-Butanone	ND	20.0		µg/Kg	1	2/16/2015 4:55:00 PM
2-Chlorotoluene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
2-Hexanone	ND	20.0		µg/Kg	1	2/16/2015 4:55:00 PM
4-Chlorotoluene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
4-Isopropyltoluene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
4-Methyl-2-pentanone	ND	20.0		µg/Kg	1	2/16/2015 4:55:00 PM
Acetone	ND	50.0		µg/Kg	1	2/16/2015 4:55:00 PM
Benzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Bromobenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Bromochloromethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Bromodichloromethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Bromoform	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Bromomethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Carbon disulfide	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Carbon tetrachloride	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Chlorobenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Chloroethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Chloroform	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Chloromethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
cis-1,2-Dichloroethene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
cis-1,3-Dichloropropene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Dibromochloromethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Dibromomethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Dichlorodifluoromethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Ethylbenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Hexachlorobutadiene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Isopropylbenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
m,p-Xylene	ND	20.0		µg/Kg	1	2/16/2015 4:55:00 PM
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Methylene chloride	ND	50.0		µg/Kg	1	2/16/2015 4:55:00 PM
Naphthalene	171	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
n-Butylbenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
n-Propylbenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM

Specialty Analytical

Date Reported: 25-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic IDW / 8128.01.08/08
Lab ID: 1502126-001
Client Sample ID: DRUMS-SO-10-36

Collection Date: 2/11/2015 11:15:00 AM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS						
		SW8260B				Analyst: CK
o-Xylene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
sec-Butylbenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Styrene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
tert-Butylbenzene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Tetrachloroethene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Toluene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
trans-1,2-Dichloroethene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
trans-1,3-Dichloropropene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Trichloroethene	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Trichlorofluoromethane	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Vinyl chloride	ND	10.0		µg/Kg	1	2/16/2015 4:55:00 PM
Surr: 1,2-Dichloroethane-d4	87.2	71.5-112		%REC	1	2/16/2015 4:55:00 PM
Surr: 4-Bromofluorobenzene	97.3	75.7-122		%REC	1	2/16/2015 4:55:00 PM
Surr: Dibromofluoromethane	96.8	64.3-124		%REC	1	2/16/2015 4:55:00 PM
Surr: Toluene-d8	103	74.9-120		%REC	1	2/16/2015 4:55:00 PM
PCB'S IN SOLIDS						
		SW 8082A				Analyst: BS
Aroclor 1016	ND	0.333		µg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1221	ND	0.333		µg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1232	ND	0.333		µg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1242	ND	0.333		µg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1248	ND	0.333		µg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1254	117	0.333		µg/Kg	1	2/23/2015 11:15:00 AM
Aroclor 1260	ND	0.333		µg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1262	ND	0.333		µg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1268	ND	0.333		µg/Kg	1	2/20/2015 10:56:00 PM
Surr: Decachlorobiphenyl	169	56.5-130	S	%REC	1	2/20/2015 10:56:00 PM
CYANIDE						
		SW9012B				Analyst: EFH
Cyanide, Total	1.01	0.100		mg/Kg	5	2/18/2015 11:24:45 AM

Specialty Analytical

Date Reported: 25-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic IDW / 8128.01.08/08
Lab ID: 1502126-002
Client Sample ID: DRUMS-AK-SO-0-10

Collection Date: 2/11/2015 12:00:00 PM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
NWTPH-DX		NWTPH-DX				Analyst: BS
Diesel	ND	18.8		mg/Kg-dry	1	2/17/2015 10:00:09 AM
Lube Oil	ND	62.7		mg/Kg-dry	1	2/17/2015 10:00:09 AM
Surr: o-Terphenyl	50.3	50-150		%REC	1	2/17/2015 10:00:09 AM
NWTPH-GX		NWTPH-GX				Analyst: BS
Gasoline	ND	3.14		mg/Kg-dry	1	2/19/2015 12:29:03 PM
Surr: 4-Bromofluorobenzene	64.6	50-150		%REC	1	2/19/2015 12:29:03 PM
TCLP 8 ICP/MS METALS-TCLP LEACHED		E1311/6020				Analyst: KP
Arsenic, TCLP	ND	6.27		µg/L	1	2/19/2015 5:19:00 PM
Barium, TCLP	677	62.7		µg/L	1	2/19/2015 5:19:00 PM
Cadmium, TCLP	ND	6.27		µg/L	1	2/19/2015 5:19:00 PM
Chromium, TCLP	ND	6.27		µg/L	1	2/19/2015 5:19:00 PM
Lead, TCLP	14.1	6.27		µg/L	1	2/19/2015 5:19:00 PM
Selenium, TCLP	ND	62.7		µg/L	1	2/19/2015 5:19:00 PM
Silver, TCLP	ND	6.27		µg/L	1	2/19/2015 5:19:00 PM
TCLP 8 TOTAL MERCURY		E7470A				Analyst: BW
Mercury, TCLP	ND	0.000100		mg/L	1	2/17/2015 3:02:09 PM
SEMIVOLATILE ORGANICS-LOW LEVEL		SW8270D				Analyst: bda
1,2,4-Trichlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
1,2-Dichlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
1,2-Diphenylhydrazine	ND	167		µg/Kg	1	2/18/2015 11:35:00 AM
1,3-Dichlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
1,4-Dichlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
1-Methylnaphthalene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
2,4,5-Trichlorophenol	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
2,4,6-Trichlorophenol	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
2,4-Dichlorophenol	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
2,4-Dimethylphenol	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
2,4-Dinitrophenol	ND	333		µg/Kg	1	2/18/2015 11:35:00 AM
2,4-Dinitrotoluene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
2,6-Dinitrotoluene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
2-Chloronaphthalene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
2-Chlorophenol	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
2-Methylnaphthalene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
2-Methylphenol	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
2-Nitroaniline	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM

Specialty Analytical

Date Reported: 25-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic IDW / 8128.01.08/08
Lab ID: 1502126-002
Client Sample ID: DRUMS-AK-SO-0-10

Collection Date: 2/11/2015 12:00:00 PM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL		SW8270D				Analyst: bda
2-Nitrophenol	ND	167		µg/Kg	1	2/18/2015 11:35:00 AM
3-&4-Methylphenol	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
3,3-Dichlorobenzidine	ND	167		µg/Kg	1	2/18/2015 11:35:00 AM
3-Nitroaniline	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
4,6-Dinitro-2-methylphenol	ND	167		µg/Kg	1	2/18/2015 11:35:00 AM
4-Bromophenyl phenyl ether	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
4-Chloro-3-methylphenol	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
4-Chloroaniline	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
4-Chlorophenyl phenyl ether	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
4-Nitroaniline	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
4-Nitrophenol	ND	167		µg/Kg	1	2/18/2015 11:35:00 AM
Acenaphthene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Acenaphthylene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Aniline	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Anthracene	46.0	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Benz(a)anthracene	52.7	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Benzidine	ND	167		µg/Kg	1	2/18/2015 11:35:00 AM
Benzo(a)pyrene	125	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Benzo(b)fluoranthene	105	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Benzo(g,h,i)perylene	149	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Benzo(k)fluoranthene	33.7	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Benzoic Acid	ND	667		µg/Kg	1	2/18/2015 11:35:00 AM
Benzyl Alcohol	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Benzyl butyl phthalate	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Bis(2-chloroethoxy)methane	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Bis(2-chloroethyl)ether	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Bis(2-chloroisopropyl)ether	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Bis(2-ethylhexyl)phthalate	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Carbazole	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Chrysene	53.3	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Dibenz(a,h)anthracene	42.7	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Dibenzofuran	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Diethyl phthalate	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Dimethyl phthalate	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Di-n-butyl phthalate	ND	50.0		µg/Kg	1	2/18/2015 11:35:00 AM
Di-n-octyl phthalate	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Fluoranthene	137	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Fluorene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Hexachlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM

Specialty Analytical

Date Reported: 25-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic IDW / 8128.01.08/08
Lab ID: 1502126-002
Client Sample ID: DRUMS-AK-SO-0-10

Collection Date: 2/11/2015 12:00:00 PM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL		SW8270D				Analyst: bda
Hexachlorobutadiene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Hexachlorocyclopentadiene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Hexachloroethane	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Indeno(1,2,3-cd)pyrene	110	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Isophorone	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Naphthalene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Nitrobenzene	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
N-Nitrosodimethylamine	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
N-Nitrosodi-n-propylamine	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
N-Nitrosodiphenylamine	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Pentachlorophenol	ND	50.0		µg/Kg	1	2/18/2015 11:35:00 AM
Phenanthrene	209	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Phenol	ND	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Pyrene	158	33.3		µg/Kg	1	2/18/2015 11:35:00 AM
Pyridine	ND	167		µg/Kg	1	2/18/2015 11:35:00 AM
Surr: 2,4,6-Tribromophenol	48.8	57.8-119	S	%REC	1	2/18/2015 11:35:00 AM
Surr: 2-Fluorobiphenyl	103	52.6-93.2	S	%REC	1	2/18/2015 11:35:00 AM
Surr: 2-Fluorophenol	112	40.7-111	S	%REC	1	2/18/2015 11:35:00 AM
Surr: 4-Terphenyl-d14	109	49.8-118		%REC	1	2/18/2015 11:35:00 AM
Surr: Nitrobenzene-d5	114	44.8-103	S	%REC	1	2/18/2015 11:35:00 AM
Surr: Phenol-d6	101	47.5-117		%REC	1	2/18/2015 11:35:00 AM
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: CK
1,1,1,2-Tetrachloroethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,1,1-Trichloroethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,1,2,2-Tetrachloroethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,1,2-Trichloroethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,1-Dichloroethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,1-Dichloroethene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,1-Dichloropropene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,2,3-Trichlorobenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,2,3-Trichloropropane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,2,4-Trichlorobenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,2,4-Trimethylbenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,2-Dibromo-3-chloropropane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,2-Dibromoethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,2-Dichlorobenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,2-Dichloroethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM

Specialty Analytical

Date Reported: 25-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic IDW / 8128.01.08/08
Lab ID: 1502126-002
Client Sample ID: DRUMS-AK-SO-0-10

Collection Date: 2/11/2015 12:00:00 PM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: CK
1,2-Dichloropropane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,3,5-Trimethylbenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,3-Dichlorobenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,3-Dichloropropane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
1,4-Dichlorobenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
2,2-Dichloropropane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
2-Butanone	ND	20.0		µg/Kg	1	2/17/2015 11:29:00 AM
2-Chlorotoluene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
2-Hexanone	ND	20.0		µg/Kg	1	2/17/2015 11:29:00 AM
4-Chlorotoluene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
4-Isopropyltoluene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
4-Methyl-2-pentanone	ND	20.0		µg/Kg	1	2/17/2015 11:29:00 AM
Acetone	ND	50.0		µg/Kg	1	2/17/2015 11:29:00 AM
Benzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Bromobenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Bromochloromethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Bromodichloromethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Bromoform	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Bromomethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Carbon disulfide	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Carbon tetrachloride	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Chlorobenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Chloroethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Chloroform	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Chloromethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
cis-1,2-Dichloroethene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
cis-1,3-Dichloropropene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Dibromochloromethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Dibromomethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Dichlorodifluoromethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Ethylbenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Hexachlorobutadiene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Isopropylbenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
m,p-Xylene	ND	20.0		µg/Kg	1	2/17/2015 11:29:00 AM
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Methylene chloride	63.1	50.0		µg/Kg	1	2/17/2015 11:29:00 AM
Naphthalene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
n-Butylbenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
n-Propylbenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM

Specialty Analytical

Date Reported: 25-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic IDW / 8128.01.08/08
Lab ID: 1502126-002
Client Sample ID: DRUMS-AK-SO-0-10

Collection Date: 2/11/2015 12:00:00 PM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS						
		SW8260B				Analyst: CK
o-Xylene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
sec-Butylbenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Styrene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
tert-Butylbenzene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Tetrachloroethene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Toluene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
trans-1,2-Dichloroethene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
trans-1,3-Dichloropropene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Trichloroethene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Trichlorofluoromethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Vinyl chloride	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Surr: 1,2-Dichloroethane-d4	101	71.5-112		%REC	1	2/17/2015 11:29:00 AM
Surr: 4-Bromofluorobenzene	109	75.7-122		%REC	1	2/17/2015 11:29:00 AM
Surr: Dibromofluoromethane	99.9	64.3-124		%REC	1	2/17/2015 11:29:00 AM
Surr: Toluene-d8	80.2	74.9-120		%REC	1	2/17/2015 11:29:00 AM
PCB'S IN SOLIDS						
		SW 8082A				Analyst: BS
Aroclor 1016	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1221	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1232	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1242	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1248	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1254	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1260	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1262	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1268	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Surr: Decachlorobiphenyl	78.5	56.5-130		%REC	1	2/20/2015 11:13:00 PM
CYANIDE						
		SW9012B				Analyst: EFH
Cyanide, Total	0.0339	0.0200		mg/Kg	1	2/18/2015 11:20:45 AM

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: ICV	SampType: ICV	TestCode: 6020_TCLP		Units: µg/L	Prep Date:			RunNo: 18928			
Client ID: ICV	Batch ID: 8938	TestNo: E1311/6020		SW3010A	Analysis Date: 2/18/2015			SeqNo: 251085			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.6	0.100	50.00	0	99.1	90	110				
Barium, TCLP	47.9	1.00	50.00	0	95.7	90	110				
Cadmium, TCLP	47.9	0.100	50.00	0	95.8	90	110				
Chromium, TCLP	50.2	0.100	50.00	0	100	90	110				
Lead, TCLP	47.8	0.100	50.00	0	95.6	90	110				
Selenium, TCLP	52.1	1.00	50.00	0	104	90	110				
Silver, TCLP	47.8	0.100	50.00	0	95.6	90	110				

Sample ID: CCV	SampType: CCV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:				RunNo: 18928			
Client ID: CCV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015				SeqNo: 251087			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	48.7	0.100	50.00	0	97.5	90	110				
Barium, TCLP	48.9	1.00	50.00	0	97.8	90	110				
Cadmium, TCLP	50.0	0.100	50.00	0	100	90	110				
Chromium, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Lead, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Selenium, TCLP	47.5	1.00	50.00	0	95.0	90	110				
Silver, TCLP	50.1	0.100	50.00	0	100	90	110				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: MB-8938	SampType: MBLK	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: PBW	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015	SeqNo: 251089						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	ND	0.100									
Barium, TCLP	ND	1.00									
Cadmium, TCLP	ND	0.100									
Chromium, TCLP	ND	0.100									
Lead, TCLP	ND	0.100									
Selenium, TCLP	ND	1.00									
Silver, TCLP	ND	0.100									

Sample ID: LCS-8938	SampType: LCS	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: LCSW	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015	SeqNo: 251090						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	45.8	0.100	50.00	0	91.6	80	120				
Barium, TCLP	50.5	1.00	50.00	0	101	80	120				
Cadmium, TCLP	50.3	0.100	50.00	0	101	80	120				
Chromium, TCLP	46.5	0.100	50.00	0	93.1	80	120				
Lead, TCLP	50.3	0.100	50.00	0	101	80	120				
Selenium, TCLP	44.5	1.00	50.00	0	88.9	80	120				
Silver, TCLP	51.0	0.100	50.00	0	102	80	120				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: A1502141-001BDUP	SampType: DUP	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: ZZZZZZ	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015	SeqNo: 251093						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	30.4	0.100						30.72	1.15	20	
Barium, TCLP	23.6	1.00						32.63	32.2	20	R
Cadmium, TCLP	ND	0.100						0	0	20	
Chromium, TCLP	ND	0.100						0.1058	200	20	RF
Lead, TCLP	0.115	0.100						0.1273	10.4	20	
Selenium, TCLP	ND	1.00						0	0	20	
Silver, TCLP	ND	0.100						0	0	20	

Sample ID: ICV	SampType: ICV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:	RunNo: 18928						
Client ID: ICV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015	SeqNo: 251363						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.1	0.100	50.00	0	98.1	90	110				
Barium, TCLP	48.5	1.00	50.00	0	97.1	90	110				
Cadmium, TCLP	48.5	0.100	50.00	0	97.0	90	110				
Chromium, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Lead, TCLP	47.5	0.100	50.00	0	95.0	90	110				
Selenium, TCLP	49.1	1.00	50.00	0	98.2	90	110				
Silver, TCLP	47.0	0.100	50.00	0	94.0	90	110				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: A1502141-001BMS	SampType: MS	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: ZZZZZZ	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015	SeqNo: 251368						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	78.2	0.100	50.00	30.72	94.9	70	130				
Barium, TCLP	70.7	1.00	50.00	32.63	76.2	70	130				
Cadmium, TCLP	48.7	0.100	50.00	0.01392	97.4	70	130				
Chromium, TCLP	44.7	0.100	50.00	0.1058	89.2	70	130				
Lead, TCLP	48.8	0.100	50.00	0.1273	97.3	70	130				
Selenium, TCLP	44.4	1.00	50.00	0	88.8	70	130				
Silver, TCLP	47.3	0.100	50.00	0	94.7	70	130				

Sample ID: A1502141-001BMSD	SampType: MSD	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: ZZZZZZ	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015	SeqNo: 251369						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	76.7	0.100	50.00	30.72	92.0	70	130	78.16	1.86	20	
Barium, TCLP	68.5	1.00	50.00	32.63	71.8	70	130	70.72	3.17	20	
Cadmium, TCLP	48.1	0.100	50.00	0.01392	96.3	70	130	48.71	1.18	20	
Chromium, TCLP	43.4	0.100	50.00	0.1058	86.6	70	130	44.73	3.02	20	
Lead, TCLP	47.2	0.100	50.00	0.1273	94.1	70	130	48.78	3.33	20	
Selenium, TCLP	44.4	1.00	50.00	0	88.8	70	130	44.38	0.0225	20	
Silver, TCLP	46.6	0.100	50.00	0	93.2	70	130	47.33	1.58	20	

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: CCV	SampType: CCV	TestCode: 6020_TCLP		Units: µg/L	Prep Date:			RunNo: 18928			
Client ID: CCV	Batch ID: 8938	TestNo: E1311/6020		SW3010A	Analysis Date: 2/19/2015			SeqNo: 251373			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	48.4	0.100	50.00	0	96.7	90	110				
Barium, TCLP	49.5	1.00	50.00	0	99.1	90	110				
Cadmium, TCLP	49.4	0.100	50.00	0	98.7	90	110				
Chromium, TCLP	46.9	0.100	50.00	0	93.9	90	110				
Lead, TCLP	48.7	0.100	50.00	0	97.4	90	110				
Selenium, TCLP	47.7	1.00	50.00	0	95.4	90	110				
Silver, TCLP	47.9	0.100	50.00	0	95.8	90	110				

Sample ID: CCV	SampType: CCV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:				RunNo: 18928			
Client ID: CCV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015				SeqNo: 251384			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.1	0.100	50.00	0	98.2	90	110				
Barium, TCLP	49.8	1.00	50.00	0	99.6	90	110				
Cadmium, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Chromium, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Lead, TCLP	48.6	0.100	50.00	0	97.2	90	110				
Selenium, TCLP	49.6	1.00	50.00	0	99.1	90	110				
Silver, TCLP	48.2	0.100	50.00	0	96.4	90	110				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8082LL_S

Sample ID: CCV	SampType: CCV	TestCode: 8082LL_S	Units: µg/Kg	Prep Date:	RunNo: 18971						
Client ID: CCV	Batch ID: 8948	TestNo: SW 8082A	3545_8082LL	Analysis Date: 2/20/2015	SeqNo: 251775						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016/1260	69.0	0.333	66.67	0	104	85	115				

Sample ID: MB-8948	SampType: MBLK	TestCode: 8082LL_S	Units: µg/Kg	Prep Date: 2/18/2015	RunNo: 18971						
Client ID: PBS	Batch ID: 8948	TestNo: SW 8082A	3545_8082LL	Analysis Date: 2/20/2015	SeqNo: 251776						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.333									
Aroclor 1221	ND	0.333									
Aroclor 1232	ND	0.333									
Aroclor 1242	ND	0.333									
Aroclor 1248	ND	0.333									
Aroclor 1254	ND	0.333									
Aroclor 1260	ND	0.333									
Aroclor 1262	ND	0.333									
Aroclor 1268	ND	0.333									
Surr: Decachlorobiphenyl	7010		6667		105	56.5	130				

Sample ID: LCS-8948	SampType: LCS	TestCode: 8082LL_S	Units: µg/Kg	Prep Date: 2/18/2015	RunNo: 18971						
Client ID: LCSS	Batch ID: 8948	TestNo: SW 8082A	3545_8082LL	Analysis Date: 2/20/2015	SeqNo: 251777						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016/1260	75.5	0.333	66.67	0	113	44.3	137				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8082LL_S

Sample ID: PCB 1254@1.0	SampType: CCV	TestCode: 8082LL_S	Units: µg/Kg	Prep Date:	RunNo: 18971						
Client ID: CCV	Batch ID: 8948	TestNo: SW 8082A	3545_8082LL	Analysis Date: 2/23/2015	SeqNo: 251784						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1254	66.7	0.333	66.67	0	100	85	115				

Sample ID: 1502129-003BMS	SampType: MS	TestCode: 8082LL_S	Units: µg/Kg	Prep Date: 2/18/2015	RunNo: 18971						
Client ID: ZZZZZZ	Batch ID: 8948	TestNo: SW 8082A	3545_8082LL	Analysis Date: 2/21/2015	SeqNo: 251785						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016/1260	28.3	0.333	66.67	0	42.5	56.6	123				SMI

Sample ID: 1502129-003BMSD	SampType: MSD	TestCode: 8082LL_S	Units: µg/Kg	Prep Date: 2/18/2015	RunNo: 18971						
Client ID: ZZZZZZ	Batch ID: 8948	TestNo: SW 8082A	3545_8082LL	Analysis Date: 2/21/2015	SeqNo: 251790						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016/1260	32.6	0.333	66.67	0	48.9	56.6	123	28.34	14.0	20	SMI

Sample ID: CCV	SampType: CCV	TestCode: 8082LL_S	Units: µg/Kg	Prep Date:	RunNo: 18971						
Client ID: CCV	Batch ID: 8948	TestNo: SW 8082A	3545_8082LL	Analysis Date: 2/21/2015	SeqNo: 251797						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016/1260	67.8	0.333	66.67	0	102	85	115				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8260_S

Sample ID: CCV MSVWS-2015	SampType: CCV	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: CCV	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250319						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	77.7	10.0	80.00	0	97.2	80	120				
1,2-Dichloropropane	75.7	10.0	80.00	0	94.6	80	120				
Chloroform	79.2	10.0	80.00	0	99.0	80	120				
Ethylbenzene	92.4	10.0	80.00	0	115	80	120				
Toluene	67.8	10.0	80.00	0	84.8	80	120				
Vinyl chloride	76.9	10.0	80.00	0	96.1	80	120				

Sample ID: LCS MSVWS-2016	SampType: LCS	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: LCSS	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250320						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	35.5	10.0	40.00	0	88.8	85.1	136				
Benzene	40.3	10.0	40.00	0	101	87.5	130				
Chlorobenzene	43.1	10.0	40.00	0	108	84.4	130				
Toluene	34.4	10.0	40.00	0	86.1	83.7	127				
Trichloroethene	40.6	10.0	40.00	0	102	88.5	123				

Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: PBS	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250321						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	10.0									
1,1,1-Trichloroethane	ND	10.0									

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8260_S

Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: PBS	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250321						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,2,2-Tetrachloroethane	ND	10.0									
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0									
1,1,2-Trichloroethane	ND	10.0									
1,1-Dichloroethane	ND	10.0									
1,1-Dichloroethene	ND	10.0									
1,1-Dichloropropene	ND	10.0									
1,2,3-Trichlorobenzene	ND	10.0									
1,2,3-Trichloropropane	ND	10.0									
1,2,4-Trichlorobenzene	ND	10.0									
1,2,4-Trimethylbenzene	ND	10.0									
1,2-Dibromo-3-chloropropane	ND	10.0									
1,2-Dibromoethane	ND	10.0									
1,2-Dichlorobenzene	ND	10.0									
1,2-Dichloroethane	ND	10.0									
1,2-Dichloropropane	ND	10.0									
1,3,5-Trimethylbenzene	ND	10.0									
1,3-Dichlorobenzene	ND	10.0									
1,3-Dichloropropane	ND	10.0									
1,4-Dichlorobenzene	ND	10.0									
2,2-Dichloropropane	ND	10.0									
2-Butanone	ND	20.0									
2-Chlorotoluene	ND	10.0									
2-Hexanone	ND	20.0									
4-Chlorotoluene	ND	10.0									
4-Isopropyltoluene	ND	10.0									
4-Methyl-2-pentanone	ND	20.0									

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8260_S

Sample ID: MB	SampType: MBLK	TestCode: 8260_S		Units: µg/Kg	Prep Date:				RunNo: 18895		
Client ID: PBS	Batch ID: 8936	TestNo: SW8260B		5030	Analysis Date: 2/16/2015				SeqNo: 250321		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acetone	ND	50.0									
Benzene	ND	10.0									
Bromobenzene	ND	10.0									
Bromochloromethane	ND	10.0									
Bromodichloromethane	ND	10.0									
Bromoform	ND	10.0									
Bromomethane	ND	10.0									
Carbon disulfide	ND	10.0									
Carbon tetrachloride	ND	10.0									
Chlorobenzene	ND	10.0									
Chloroethane	ND	10.0									
Chloroform	ND	10.0									
Chloromethane	ND	10.0									
cis-1,2-Dichloroethene	ND	10.0									
cis-1,3-Dichloropropene	ND	10.0									
Dibromochloromethane	ND	10.0									
Dibromomethane	ND	10.0									
Dichlorodifluoromethane	ND	10.0									
Ethylbenzene	ND	10.0									
Hexachlorobutadiene	ND	10.0									
Isopropylbenzene	ND	10.0									
m,p-Xylene	ND	20.0									
Methyl tert-butyl ether	ND	10.0									
Methylene chloride	ND	50.0									
Naphthalene	ND	10.0									
n-Butylbenzene	ND	10.0									

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8260_S

Sample ID: MB	SampType: MBLK	TestCode: 8260_S		Units: µg/Kg	Prep Date:				RunNo: 18895		
Client ID: PBS	Batch ID: 8936	TestNo: SW8260B		5030	Analysis Date: 2/16/2015				SeqNo: 250321		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Propylbenzene	ND	10.0									
o-Xylene	ND	10.0									
sec-Butylbenzene	ND	10.0									
Styrene	ND	10.0									
tert-Butylbenzene	ND	10.0									
Tetrachloroethene	ND	10.0									
Toluene	ND	10.0									
trans-1,2-Dichloroethene	ND	10.0									
trans-1,3-Dichloropropene	ND	10.0									
Trichloroethene	ND	10.0									
Trichlorofluoromethane	ND	10.0									
Vinyl chloride	ND	10.0									
Surr: 1,2-Dichloroethane-d4	90.8		100.0		90.8	71.5	112				
Surr: 4-Bromofluorobenzene	96.7		100.0		96.7	75.7	122				
Surr: Dibromofluoromethane	94.8		100.0		94.8	64.3	124				
Surr: Toluene-d8	107		100.0		107	74.9	120				

Sample ID: 1502116-001AMS	SampType: MS	TestCode: 8260_S	Units: µg/Kg	Prep Date: 2/16/2015	RunNo: 18895						
Client ID: ZZZZZZ	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250325						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	42800	10000	40000	0	107	46.6	147				
Benzene	42600	10000	40000	0	107	65.2	121				
Chlorobenzene	45600	10000	40000	0	114	40.9	122				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8260_S

Sample ID: 1502116-001AMS	SampType: MS	TestCode: 8260_S	Units: µg/Kg	Prep Date: 2/16/2015	RunNo: 18895						
Client ID: ZZZZZZ	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250325						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	47000	10000	40000	5600	103	52.1	127				
Trichloroethene	44300	10000	40000	0	111	57.6	122				

Sample ID: 1502116-001AMSD	SampType: MSD	TestCode: 8260_S	Units: µg/Kg	Prep Date: 2/16/2015	RunNo: 18895						
Client ID: ZZZZZZ	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250326						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	49600	10000	40000	0	124	46.6	147	42790	14.6	30	
Benzene	42500	10000	40000	0	106	65.2	121	42610	0.235	30	
Chlorobenzene	43000	10000	40000	0	108	40.9	122	45570	5.69	30	
Toluene	48000	10000	40000	5600	106	52.1	127	46970	2.11	30	
Trichloroethene	45500	10000	40000	0	114	57.6	122	44330	2.67	30	

Sample ID: CCV MSVWS-2015	SampType: CCV	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: CCV	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/17/2015	SeqNo: 250786						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	39.8	10.0	40.00	0	99.4	80	120				
1,2-Dichloropropane	41.2	10.0	40.00	0	103	80	120				
Chloroform	44.0	10.0	40.00	0	110	80	120				
Ethylbenzene	44.6	10.0	40.00	0	112	80	120				
Toluene	33.9	10.0	40.00	0	84.6	80	120				
Vinyl chloride	34.1	10.0	40.00	0	85.3	80	120				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8260_S

Sample ID: CCV MSVWS-2015	SampType: CCV	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: CCV	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/17/2015	SeqNo: 250786						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: CCB	SampType: CCB	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: CCB	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/17/2015	SeqNo: 250787						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,1,1,2-Tetrachloroethane	ND	10.0
1,1,1-Trichloroethane	ND	10.0
1,1,2,2-Tetrachloroethane	ND	10.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0
1,1,2-Trichloroethane	ND	10.0
1,1-Dichloroethane	ND	10.0
1,1-Dichloroethene	ND	10.0
1,1-Dichloropropene	ND	10.0
1,2,3-Trichlorobenzene	ND	10.0
1,2,3-Trichloropropane	ND	10.0
1,2,4-Trichlorobenzene	ND	10.0
1,2,4-Trimethylbenzene	ND	10.0
1,2-Dibromo-3-chloropropane	ND	10.0
1,2-Dibromoethane	ND	10.0
1,2-Dichlorobenzene	ND	10.0
1,2-Dichloroethane	ND	10.0
1,2-Dichloropropane	ND	10.0
1,3,5-Trimethylbenzene	ND	10.0
1,3-Dichlorobenzene	ND	10.0

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8260_S

Sample ID: CCB	SampType: CCB	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: CCB	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/17/2015	SeqNo: 250787						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,3-Dichloropropane	ND	10.0									
1,4-Dichlorobenzene	ND	10.0									
2,2-Dichloropropane	ND	10.0									
2-Butanone	ND	20.0									
2-Chlorotoluene	ND	10.0									
2-Hexanone	ND	20.0									
4-Chlorotoluene	ND	10.0									
4-Isopropyltoluene	ND	10.0									
4-Methyl-2-pentanone	ND	20.0									
Acetone	ND	50.0									
Benzene	ND	10.0									
Bromobenzene	ND	10.0									
Bromochloromethane	ND	10.0									
Bromodichloromethane	ND	10.0									
Bromoform	ND	10.0									
Bromomethane	ND	10.0									
Carbon disulfide	ND	10.0									
Carbon tetrachloride	ND	10.0									
Chlorobenzene	ND	10.0									
Chloroethane	ND	10.0									
Chloroform	ND	10.0									
Chloromethane	ND	10.0									
cis-1,2-Dichloroethene	ND	10.0									
cis-1,3-Dichloropropene	ND	10.0									
Dibromochloromethane	ND	10.0									
Dibromomethane	ND	10.0									

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8260_S

Sample ID: CCB	SampType: CCB	TestCode: 8260_S		Units: µg/Kg	Prep Date:				RunNo: 18895		
Client ID: CCB	Batch ID: 8936	TestNo: SW8260B		5030	Analysis Date: 2/17/2015				SeqNo: 250787		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane	ND	10.0									
Ethylbenzene	ND	10.0									
Hexachlorobutadiene	ND	10.0									
Isopropylbenzene	ND	10.0									
m,p-Xylene	ND	20.0									
Methyl tert-butyl ether	ND	10.0									
Methylene chloride	ND	50.0									
Naphthalene	ND	10.0									
n-Butylbenzene	ND	10.0									
n-Propylbenzene	ND	10.0									
o-Xylene	ND	10.0									
sec-Butylbenzene	ND	10.0									
Styrene	ND	10.0									
tert-Butylbenzene	ND	10.0									
Tetrachloroethene	ND	10.0									
Toluene	ND	10.0									
trans-1,2-Dichloroethene	ND	10.0									
trans-1,3-Dichloropropene	ND	10.0									
Trichloroethene	ND	10.0									
Trichlorofluoromethane	ND	10.0									
Vinyl chloride	ND	10.0									
Surr: 1,2-Dichloroethane-d4	104		100.0		104	71.5	112				
Surr: 4-Bromofluorobenzene	97.0		100.0		97.0	75.7	122				
Surr: Dibromofluoromethane	110		100.0		110	64.3	124				
Surr: Toluene-d8	102		100.0		102	74.9	120				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8270LL_S

Sample ID: CCV-8941	SampType: CCV	TestCode: 8270LL_S	Units: µg/Kg	Prep Date:	RunNo: 18926						
Client ID: CCV	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250892						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,4-Dichlorobenzene	1120	33.3	1333	0	84.2	80	120				
2,4,6-Trichlorophenol	1490	33.3	1333	0	112	80	120				
2,4-Dichlorophenol	1440	33.3	1333	0	108	80	120				
2-Nitrophenol	1520	167	1333	0	114	80	120				
4-Chloro-3-methylphenol	1530	33.3	1333	0	115	80	120				
Acenaphthene	1580	33.3	1333	0	118	80	120				
Benzo(a)pyrene	1560	33.3	1333	0	117	80	120				
Di-n-octyl phthalate	1550	33.3	1333	0	117	80	120				
Fluoranthene	1580	33.3	1333	0	119	80	120				
Hexachlorobutadiene	1500	33.3	1333	0	112	80	120				
N-Nitrosodiphenylamine	1510	33.3	1333	0	113	80	120				
Pentachlorophenol	1080	50.0	1333	0	80.9	80	120				
Phenol	1580	33.3	1333	0	119	80	120				

Sample ID: LCS-8941	SampType: LCS	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: LCSS	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250893						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	1320	33.3	1667	0	79.2	30.9	106				
1,4-Dichlorobenzene	1130	33.3	1667	0	68.0	31.4	98.2				
2,4-Dinitrotoluene	1330	33.3	1667	0	79.6	59.7	111				
2-Chlorophenol	1390	33.3	1667	0	83.7	46.2	105				
4-Chloro-3-methylphenol	1810	33.3	1667	0	109	47.4	114				
4-Nitrophenol	1940	167	1667	0	116	45.3	114				SO

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8270LL_S

Sample ID: LCS-8941	SampType: LCS	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: LCSS	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250893						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1600	33.3	1667	0	95.8	48.2	105				SO
N-Nitrosodi-n-propylamine	1690	33.3	1667	0	102	42.4	101				
Pentachlorophenol	843	50.0	1667	0	50.6	46.8	120				
Phenol	1600	33.3	1667	0	95.9	51.1	103				
Pyrene	1390	33.3	1667	0	83.2	56.7	130				

Sample ID: MB-8941	SampType: MBLK	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: PBS	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250894						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	ND	33.3									
1,2-Dichlorobenzene	ND	33.3									
1,2-Diphenylhydrazine	ND	167									
1,3-Dichlorobenzene	ND	33.3									
1,4-Dichlorobenzene	ND	33.3									
1-Methylnaphthalene	ND	33.3									
2,4,5-Trichlorophenol	ND	33.3									
2,4,6-Trichlorophenol	ND	33.3									
2,4-Dichlorophenol	ND	33.3									
2,4-Dimethylphenol	ND	33.3									
2,4-Dinitrophenol	ND	333									
2,4-Dinitrotoluene	ND	33.3									
2,6-Dinitrotoluene	ND	33.3									
2-Chloronaphthalene	ND	33.3									

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8270LL_S

Sample ID: MB-8941	SampType: MBLK	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: PBS	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250894						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Chlorophenol	ND	33.3									
2-Methylnaphthalene	ND	33.3									
2-Methylphenol	ND	33.3									
2-Nitroaniline	ND	33.3									
2-Nitrophenol	ND	167									
3-&4-Methylphenol	ND	33.3									
3,3-Dichlorobenzidine	ND	167									
3-Nitroaniline	ND	33.3									
4,6-Dinitro-2-methylphenol	ND	167									
4-Bromophenyl phenyl ether	ND	33.3									
4-Chloro-3-methylphenol	ND	33.3									
4-Chloroaniline	ND	33.3									
4-Chlorophenyl phenyl ether	ND	33.3									
4-Nitroaniline	ND	33.3									
4-Nitrophenol	ND	167									
Acenaphthene	ND	33.3									
Acenaphthylene	ND	33.3									
Aniline	ND	33.3									
Anthracene	ND	33.3									
Benz(a)anthracene	ND	33.3									
Benzidine	ND	167									
Benzo(a)pyrene	ND	33.3									
Benzo(b)fluoranthene	ND	33.3									
Benzo(g,h,i)perylene	ND	33.3									
Benzo(k)fluoranthene	ND	33.3									
Benzoic Acid	ND	667									

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

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S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8270LL_S

Sample ID: MB-8941	SampType: MBLK	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: PBS	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250894						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzyl Alcohol	ND	33.3									
Benzyl butyl phthalate	ND	33.3									
Bis(2-chloroethoxy)methane	ND	33.3									
Bis(2-chloroethyl)ether	ND	33.3									
Bis(2-chloroisopropyl)ether	ND	33.3									
Bis(2-ethylhexyl)phthalate	ND	33.3									
Carbazole	ND	33.3									
Chrysene	ND	33.3									
Dibenz(a,h)anthracene	ND	33.3									
Dibenzofuran	ND	33.3									
Diethyl phthalate	ND	33.3									
Dimethyl phthalate	ND	33.3									
Di-n-butyl phthalate	ND	50.0									
Di-n-octyl phthalate	ND	33.3									
Fluoranthene	ND	33.3									
Fluorene	ND	33.3									
Hexachlorobenzene	ND	33.3									
Hexachlorobutadiene	ND	33.3									
Hexachlorocyclopentadiene	ND	33.3									
Hexachloroethane	ND	33.3									
Indeno(1,2,3-cd)pyrene	ND	33.3									
Isophorone	ND	33.3									
Naphthalene	ND	33.3									
Nitrobenzene	ND	33.3									
N-Nitrosodimethylamine	ND	33.3									
N-Nitrosodi-n-propylamine	ND	33.3									

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8270LL_S

Sample ID: MB-8941	SampType: MBLK	TestCode: 8270LL_S		Units: µg/Kg	Prep Date: 2/17/2015				RunNo: 18926		
Client ID: PBS	Batch ID: 8941	TestNo: SW8270D		SW 3545A	Analysis Date: 2/18/2015				SeqNo: 250894		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
N-Nitrosodiphenylamine	ND	33.3									
Pentachlorophenol	ND	50.0									
Phenanthrene	ND	33.3									
Phenol	ND	33.3									
Pyrene	ND	33.3									
Pyridine	ND	167									
Surr: 2,4,6-Tribromophenol	2950		3333		88.6	57.8	119				
Surr: 2-Fluorobiphenyl	2710		3333		81.3	52.6	93.2				
Surr: 2-Fluorophenol	3590		3333		108	40.7	111				
Surr: 4-Terphenyl-d14	2720		3333		81.6	49.8	118				
Surr: Nitrobenzene-d5	3460		3333		104	44.8	103				S
Surr: Phenol-d6	3380		3333		102	47.5	117				

Sample ID: 1502126-002BMS	SampType: MS	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: DRUMS-AK-SO-0-10	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250895						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	1040	33.3	1667	0	62.7	31.1	92.7				
1,4-Dichlorobenzene	1220	33.3	1667	0	73.1	16.5	85.6				
2,4-Dinitrotoluene	1070	33.3	1667	13.00	63.6	43.4	118				
2-Chlorophenol	968	33.3	1667	0	58.1	36.8	103				
4-Chloro-3-methylphenol	1620	33.3	1667	0	96.9	49.5	119				
4-Nitrophenol	1430	167	1667	0	86.0	45	111				
Acenaphthene	1170	33.3	1667	31.67	68.4	45.1	102				

Qualifiers: B Analyte detected in the associated Method Blank
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R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: 8270LL_S

Sample ID: 1502126-002BMS	SampType: MS	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: DRUMS-AK-SO-0-10	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250895						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
N-Nitrosodi-n-propylamine	1180	33.3	1667	0	71.1	45.6	94.1				
Pentachlorophenol	635	50.0	1667	0	38.1	36.6	112				
Phenol	1470	33.3	1667	0	88.4	37.7	107				
Pvrene	945	33.3	1667	157.7	47.2	42.4	131				

Sample ID: 1502126-002BMSD	SampType: MSD	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: DRUMS-AK-SO-0-10	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250896						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	1220	33.3	1667	0	73.0	31.1	92.7	1044	15.3	20	
1,4-Dichlorobenzene	1260	33.3	1667	0	75.6	16.5	85.6	1218	3.42	20	
2,4-Dinitrotoluene	1190	33.3	1667	13.00	70.5	43.4	118	1072	10.2	20	
2-Chlorophenol	1250	33.3	1667	0	74.9	36.8	103	968.3	25.3	20	R
4-Chloro-3-methylphenol	1610	33.3	1667	0	96.9	49.5	119	1616	0.0826	20	
4-Nitrophenol	1920	167	1667	0	115	45	111	1434	28.8	20	SR
Acenaphthene	1570	33.3	1667	31.67	92.4	45.1	102	1172	29.1	20	R
N-Nitrosodi-n-propylamine	1540	33.3	1667	0	92.6	45.6	94.1	1185	26.3	20	R
Pentachlorophenol	834	50.0	1667	0	50.0	36.6	112	635.0	27.1	20	R
Phenol	1820	33.3	1667	0	109	37.7	107	1474	20.9	20	SR
Pyrene	1650	33.3	1667	157.7	89.8	42.4	131	945.0	54.6	20	R

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: CN_S

Sample ID: R18935ICV	SampType: ICV	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: ICV	Batch ID: R18935	TestNo: SW9012B		Analysis Date: 2/18/2015	SeqNo: 251075						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide, Total 0.323 0.0200 0.3000 0 108 90 110

Sample ID: MB-R18935	SampType: MBLK	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: PBS	Batch ID: R18935	TestNo: SW9012B	Analysis Date: 2/18/2015	SeqNo: 251076							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide, Total ND 0.0200

Sample ID: LCS-R18935	SampType: LCS	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: LCSS	Batch ID: R18935	TestNo: SW9012B		Analysis Date: 2/18/2015	SeqNo: 251077						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide, Total 0.227 0.0200 0.2000 0 114 85 115

Sample ID: R18935CCV	SampType: CCV	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: CCV	Batch ID: R18935	TestNo: SW9012B		Analysis Date: 2/18/2015	SeqNo: 251078						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide, Total 0.368 0.0200 0.3500 0 105 90 110

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

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ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: CN_S

Sample ID: 1502126-001BMS	SampType: MS	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: DRUMS-SO-10-36	Batch ID: R18935	TestNo: SW9012B	Analysis Date: 2/18/2015	SeqNo: 251082							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	1.08	0.100	0.1000	1.006	70.5	80	120				SMC

Sample ID: 1502126-001BMSD	SampType: MSD	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: DRUMS-SO-10-36	Batch ID: R18935	TestNo: SW9012B	Analysis Date: 2/18/2015	SeqNo: 251083							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	1.04	0.100	0.1000	1.006	32.5	80	120	1.076	3.59	20	SMC

Sample ID: R18935CCV	SampType: CCV	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: CCV	Batch ID: R18935	TestNo: SW9012B	Analysis Date: 2/18/2015	SeqNo: 251084							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.381	0.0200	0.3500	0	109	90	110				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: HG_CT

Sample ID: MB-8944	SampType: MBLK	TestCode: HG_CT	Units: mg/L	Prep Date: 2/17/2015	RunNo: 18910						
Client ID: PBW	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250577						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury, TCLP ND 0.000100

Sample ID: LCS-8944	SampType: LCS	TestCode: HG_CT	Units: mg/L	Prep Date: 2/17/2015	RunNo: 18910						
Client ID: LCSW	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250578						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury, TCLP 0.00379 0.000100 0.004000 0 94.7 85.4 116

Sample ID: 1502126-002BMS	SampType: MS	TestCode: HG_CT	Units: mg/L	Prep Date: 2/17/2015	RunNo: 18910						
Client ID: DRUMS-AK-SO-0-10	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250584						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury, TCLP 0.00407 0.000100 0.004000 0 102 69.5 125

Sample ID: 1502126-002BMSD	SampType: MSD	TestCode: HG_CT	Units: mg/L	Prep Date: 2/17/2015	RunNo: 18910						
Client ID: DRUMS-AK-SO-0-10	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250585						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury, TCLP 0.00382 0.000100 0.004000 0 95.5 69.5 125 0.004069 6.31 20

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

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R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: HG_CT

Sample ID: CCV	SampType: CCV	TestCode: HG_CT	Units: mg/L	Prep Date:	RunNo: 18910						
Client ID: CCV	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250588						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury, TCLP	0.00371	0.000100	0.004000	0	92.8	90	110				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: NWTPHDX_S

Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date:	RunNo: 18906						
Client ID: CCV	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/16/2015	SeqNo: 250542						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	1400	15.0	1332	0	105	85	115				
Lube Oil	731	50.0	666.0	0	110	85	115				

Sample ID: MB-8931	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 2/16/2015	RunNo: 18906						
Client ID: PBS	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/16/2015	SeqNo: 250543						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	28.9		33.33		86.6	50	150				

Sample ID: LCS-8931	SampType: LCS	TestCode: NWTPHDX_S Units: mg/Kg				Prep Date: 2/16/2015			RunNo: 18906		
Client ID: LCSS	Batch ID: 8931	TestNo: NWTPH-Dx SW3545A				Analysis Date: 2/16/2015			SeqNo: 250544		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	159	15.0	166.7	0	95.3	76.3	125				
Lube Oil	128	50.0	166.7	0	76.7	69.9	127				

Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date:	RunNo: 18906						
Client ID: CCV	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/17/2015	SeqNo: 250546						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: NWTPHDX_S

Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date:	RunNo: 18906						
Client ID: CCV	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/17/2015	SeqNo: 250546						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	1050	15.0	999.0	0	105	85	115				
Lube Oil	529	50.0	499.5	0	106	85	115				

Sample ID: CCB	SampType: CCB	TestCode: NWTPHDX_S		Units: mg/Kg	Prep Date:				RunNo: 18906		
Client ID: CCB	Batch ID: 8931	TestNo: NWTPH-Dx		SW3545A	Analysis Date: 2/17/2015				SeqNo: 250547		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	28.5		33.30		85.5	50	150				

Sample ID: 1502131-001ADUP	SampType: DUP	TestCode: NWTPHDX_S	Units: mg/Kg-dry	Prep Date: 2/16/2015	RunNo: 18906						
Client ID: ZZZZZZ	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/17/2015	SeqNo: 250551						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	1160	20.9						878.4	27.7	20	RA1
Lube Oil	334	69.5						229.1	37.3	20	RA2

Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date:	RunNo: 18906						
Client ID: CCV	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/17/2015	SeqNo: 250556						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

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R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: NWTPHDX_S

Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date:	RunNo: 18906						
Client ID: CCV	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/17/2015	SeqNo: 250556						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	1430	15.0	1332	0	107	85	115				
Lube Oil	732	50.0	666.0	0	110	85	115				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: NWTPHGX_S

Sample ID: CCV	SampType: CCV	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date:	RunNo: 18950						
Client ID: CCV	Batch ID: 8937	TestNo: NWTPH-Gx	5030_G_S	Analysis Date: 2/19/2015	SeqNo: 251411						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	100	2.50	100.0	0	100	80	120				
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Sample ID: MB-8937	SampType: MBLK	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date: 2/17/2015	RunNo: 18950						
Client ID: PBS	Batch ID: 8937	TestNo: NWTPH-Gx	5030_G_S	Analysis Date: 2/19/2015	SeqNo: 251412						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	2.50									
Surr: 4-Bromofluorobenzene	4.06		5.000		81.2	50	150				

Sample ID: LCS-8937	SampType: LCS	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date: 2/17/2015	RunNo: 18950						
Client ID: LCSS	Batch ID: 8937	TestNo: NWTPH-Gx	5030_G_S	Analysis Date: 2/19/2015	SeqNo: 251413						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	58.3	2.50	50.00	0	117	53.5	121				
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Sample ID: 1502126-001ADUP	SampType: DUP	TestCode: NWTPHGX_S	Units: mg/Kg-dry	Prep Date: 2/17/2015	RunNo: 18950						
Client ID: DRUMS-SO-10-36	Batch ID: 8937	TestNo: NWTPH-Gx	5030_G_S	Analysis Date: 2/19/2015	SeqNo: 251495						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	78.5	3.49						21.34	115	20	RMI
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Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502126

25-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08

TestCode: NWTPHGX_S

Sample ID: CCV	SampType: CCV	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date:	RunNo: 18950						
Client ID: CCV	Batch ID: 8937	TestNo: NWTPH-Gx	5030_G_S	Analysis Date: 2/20/2015	SeqNo: 251509						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	136	2.50	125.0	0	109	80	120				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

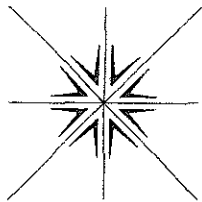
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

KEY TO FLAGS

Rev. May 12, 2010

- A This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
- A1 This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
- A2 This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
- A3 The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
- A4 The product appears to be aged or degraded diesel.
- B The blank exhibited a positive result great than the reporting limit for this compound.
- CN See Case Narrative.
- D Result is based from a dilution.
- E Result exceeds the calibration range for this compound. The result should be considered as estimate.
- F The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
- G Result may be biased high due to biogenic interferences. Clean up is recommended.
- H Sample was analyzed outside recommended holding time.
- HT At clients request, samples was analyzed outside of recommended holding time.
- J The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
- K Diesel result is biased high due to amount of Oil contained in the sample.
- L Diesel result is biased high due to amount of Gasoline contained in the sample.
- M Oil result is biased high due to amount of Diesel contained in the sample.
- MC Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
- MI Result is outside control limits due to matrix interference.
- MSA Value determined by Method of Standard Addition.
- O Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
- Q Detection levels elevated due to sample matrix.
- R RPD control limits were exceeded.
- RF Duplicate failed due to result being at or near the method-reporting limit.
- RP Matrix spike values exceed established QC limits; post digestion spike is in control.
- S Recovery is outside control limits.
- SC Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
- * The result for this parameter was greater than the maximum contaminant level of the TCLP regulatory limit.

Page 1 of 1



**11711 SE Capps Road
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336**

Contact Person/Project Manager James Peale
Company Maul Foster & Alang, Inc.
Address 2001 NW 19th Avenue Suite 200
Portland, OR 97209
Phone 971-544-2139 Fax 971-544-2440
Project No. 8128.01.08/08 Project Name Siltronic IDW
Project Site Location OR ☒ WA ☐ Other ☐
Invoice To MEA P.O. No. _____

Collected By:

Signature.

Printed.

Signature_____

Printed_

Turn Around Time

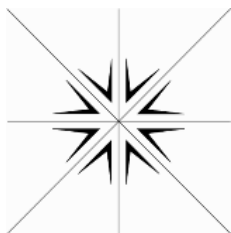
~~Normal~~ 5-7 Business Days

~~DRUSH~~

Specify

Rush Analyses Must Be Scheduled With The Lab In Advance

[illegible]



Specialty Analytical

11711 SE Capps Road, Ste B
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

February 20, 2015

James Peale
Maul Foster & Alongi
400 E. Mill Plain Blvd.
Suite 400
Vancouver, WA 98660
TEL: (360) 694-2691
FAX (360) 906-1958
RE: Siltronic / 8128.01.08/08

Dear James Peale:

Order No.: 1502131

Specialty Analytical received 1 sample(s) on 2/13/2015 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read "Marty French".

Marty French
Lab Director

Specialty Analytical

Date Reported: 20-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08
Lab ID: 1502131-001
Client Sample ID: DROPBOX-SO

Collection Date: 2/12/2015 1:50:00 PM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
NWTPH-DX		NWTPH-DX				Analyst: BS
Diesel	878	20.9	A1	mg/Kg-dry	1	2/17/2015 10:22:09 AM
Lube Oil	229	69.5	A2	mg/Kg-dry	1	2/17/2015 10:22:09 AM
Surr: o-Terphenyl	51.5	50-150		%REC	1	2/17/2015 10:22:09 AM
NWTPH-GX		NWTPH-GX				Analyst: BS
Gasoline	426	3.48		mg/Kg-dry	1	2/19/2015 2:29:03 PM
Surr: 4-Bromofluorobenzene	64.4	50-150		%REC	1	2/19/2015 2:29:03 PM
TCLP 8 ICP/MS METALS-TCLP LEACHED		E1311/6020				Analyst: KP
Arsenic, TCLP	ND	6.95		µg/L	1	2/19/2015 5:27:00 PM
Barium, TCLP	646	69.5		µg/L	1	2/19/2015 5:27:00 PM
Cadmium, TCLP	ND	6.95		µg/L	1	2/19/2015 5:27:00 PM
Chromium, TCLP	9.32	6.95		µg/L	1	2/19/2015 5:27:00 PM
Lead, TCLP	10.0	6.95		µg/L	1	2/19/2015 5:27:00 PM
Selenium, TCLP	ND	69.5		µg/L	1	2/19/2015 5:27:00 PM
Silver, TCLP	ND	6.95		µg/L	1	2/19/2015 5:27:00 PM
TCLP 8 TOTAL MERCURY		E7470A				Analyst: BW
Mercury, TCLP	ND	0.000100		mg/L	1	2/17/2015 3:10:09 PM
SEMIVOLATILE ORGANICS-LOW LEVEL		SW8270D				Analyst: bda
1,2,4-Trichlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
1,2-Dichlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
1,2-Diphenylhydrazine	ND	167		µg/Kg	1	2/18/2015 2:28:00 PM
1,3-Dichlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
1,4-Dichlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
1-Methylnaphthalene	6460	133		µg/Kg	4	2/18/2015 2:00:00 PM
2,4,5-Trichlorophenol	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
2,4,6-Trichlorophenol	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
2,4-Dichlorophenol	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
2,4-Dimethylphenol	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
2,4-Dinitrophenol	ND	333		µg/Kg	1	2/18/2015 2:28:00 PM
2,4-Dinitrotoluene	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
2,6-Dinitrotoluene	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
2-Chloronaphthalene	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
2-Chlorophenol	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
2-Methylnaphthalene	13400	333		µg/Kg	10	2/18/2015 1:31:00 PM
2-Methylphenol	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
2-Nitroaniline	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM

Specialty Analytical

Date Reported: 20-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08
Lab ID: 1502131-001
Client Sample ID: DROPBOX-SO

Collection Date: 2/12/2015 1:50:00 PM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL		SW8270D				Analyst: bda
2-Nitrophenol	ND	167		µg/Kg	1	2/18/2015 2:28:00 PM
3-&4-Methylphenol	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
3,3-Dichlorobenzidine	ND	167		µg/Kg	1	2/18/2015 2:28:00 PM
3-Nitroaniline	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
4,6-Dinitro-2-methylphenol	ND	167		µg/Kg	1	2/18/2015 2:28:00 PM
4-Bromophenyl phenyl ether	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
4-Chloro-3-methylphenol	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
4-Chloroaniline	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
4-Chlorophenyl phenyl ether	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
4-Nitroaniline	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
4-Nitrophenol	ND	167		µg/Kg	1	2/18/2015 2:28:00 PM
Acenaphthene	10700	333		µg/Kg	10	2/18/2015 1:31:00 PM
Acenaphthylene	536	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Aniline	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Anthracene	4530	133		µg/Kg	4	2/18/2015 2:00:00 PM
Benz(a)anthracene	2550	133		µg/Kg	4	2/18/2015 2:00:00 PM
Benzidine	ND	167		µg/Kg	1	2/18/2015 2:28:00 PM
Benzo(a)pyrene	3030	133		µg/Kg	4	2/18/2015 2:00:00 PM
Benzo(b)fluoranthene	2570	133		µg/Kg	4	2/18/2015 2:00:00 PM
Benzo(g,h,i)perylene	2130	133		µg/Kg	4	2/18/2015 2:00:00 PM
Benzo(k)fluoranthene	620	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Benzoic Acid	ND	667		µg/Kg	1	2/18/2015 2:28:00 PM
Benzyl Alcohol	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Benzyl butyl phthalate	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Bis(2-chloroethoxy)methane	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Bis(2-chloroethyl)ether	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Bis(2-chloroisopropyl)ether	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Bis(2-ethylhexyl)phthalate	72.7	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Carbazole	1890	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Chrysene	2690	133		µg/Kg	4	2/18/2015 2:00:00 PM
Dibenz(a,h)anthracene	436	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Dibenzofuran	852	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Diethyl phthalate	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Dimethyl phthalate	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Di-n-butyl phthalate	ND	50.0		µg/Kg	1	2/18/2015 2:28:00 PM
Di-n-octyl phthalate	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Fluoranthene	8030	133		µg/Kg	4	2/18/2015 2:00:00 PM
Fluorene	5270	133		µg/Kg	4	2/18/2015 2:00:00 PM
Hexachlorobenzene	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM

Specialty Analytical

Date Reported: 20-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08
Lab ID: 1502131-001
Client Sample ID: DROPBOX-SO

Collection Date: 2/12/2015 1:50:00 PM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL		SW8270D				Analyst: bda
Hexachlorobutadiene	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Hexachlorocyclopentadiene	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Hexachloroethane	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Indeno(1,2,3-cd)pyrene	1530	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Isophorone	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Naphthalene	64300	3330		µg/Kg	100	2/18/2015 1:02:00 PM
Nitrobenzene	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
N-Nitrosodimethylamine	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
N-Nitrosodi-n-propylamine	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
N-Nitrosodiphenylamine	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Pentachlorophenol	ND	50.0		µg/Kg	1	2/18/2015 2:28:00 PM
Phenanthrene	21800	333		µg/Kg	10	2/18/2015 1:31:00 PM
Phenol	ND	33.3		µg/Kg	1	2/18/2015 2:28:00 PM
Pyrene	8710	133		µg/Kg	4	2/18/2015 2:00:00 PM
Pyridine	ND	167		µg/Kg	1	2/18/2015 2:28:00 PM
Surr: 2,4,6-Tribromophenol	56.2	57.8-119	SMI	%REC	1	2/18/2015 2:28:00 PM
Surr: 2-Fluorobiphenyl	65.4	52.6-93.2		%REC	4	2/18/2015 2:00:00 PM
Surr: 2-Fluorophenol	104	40.7-111		%REC	4	2/18/2015 2:00:00 PM
Surr: 4-Terphenyl-d14	100	49.8-118		%REC	4	2/18/2015 2:00:00 PM
Surr: Nitrobenzene-d5	79.2	44.8-103		%REC	4	2/18/2015 2:00:00 PM
Surr: Phenol-d6	107	47.5-117		%REC	4	2/18/2015 2:00:00 PM
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: CK
1,1,1,2-Tetrachloroethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,1,1-Trichloroethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,1,2,2-Tetrachloroethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,1,2-Trichloroethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,1-Dichloroethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,1-Dichloroethene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,1-Dichloropropene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,2,3-Trichlorobenzene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,2,3-Trichloropropane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,2,4-Trichlorobenzene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,2,4-Trimethylbenzene	4620	1000		µg/Kg	100	2/17/2015 2:27:00 PM
1,2-Dibromo-3-chloropropane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,2-Dibromoethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,2-Dichlorobenzene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,2-Dichloroethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM

Specialty Analytical

Date Reported: 20-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08
Lab ID: 1502131-001
Client Sample ID: DROPBOX-SO

Collection Date: 2/12/2015 1:50:00 PM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS		SW8260B		Analyst: CK		
1,2-Dichloropropane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,3,5-Trimethylbenzene	1550	1000		µg/Kg	100	2/17/2015 2:27:00 PM
1,3-Dichlorobenzene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,3-Dichloropropane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
1,4-Dichlorobenzene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
2,2-Dichloropropane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
2-Butanone	ND	20.0		µg/Kg	1	2/17/2015 3:32:00 PM
2-Chlorotoluene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
2-Hexanone	ND	20.0		µg/Kg	1	2/17/2015 3:32:00 PM
4-Chlorotoluene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
4-Isopropyltoluene	120	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
4-Methyl-2-pentanone	ND	20.0		µg/Kg	1	2/17/2015 3:32:00 PM
Acetone	ND	50.0		µg/Kg	1	2/17/2015 3:32:00 PM
Benzene	1820	1000		µg/Kg	100	2/17/2015 2:27:00 PM
Bromobenzene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Bromochloromethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Bromodichloromethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Bromoform	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Bromomethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Carbon disulfide	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Carbon tetrachloride	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Chlorobenzene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Chloroethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Chloroform	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Chloromethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
cis-1,2-Dichloroethene	44.1	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
cis-1,3-Dichloropropene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Dibromochloromethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Dibromomethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Dichlorodifluoromethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Ethylbenzene	5240	1000		µg/Kg	100	2/17/2015 2:27:00 PM
Hexachlorobutadiene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Isopropylbenzene	213	100		µg/Kg	10	2/17/2015 3:00:00 PM
m,p-Xylene	4940	2000		µg/Kg	100	2/17/2015 2:27:00 PM
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Methylene chloride	ND	50.0		µg/Kg	1	2/17/2015 3:32:00 PM
Naphthalene	451000	100000		µg/Kg	10000	2/17/2015 1:23:00 PM
n-Butylbenzene	34.3	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
n-Propylbenzene	105	10.0		µg/Kg	1	2/17/2015 3:32:00 PM

Specialty Analytical

Date Reported: 20-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08
Lab ID: 1502131-001
Client Sample ID: DROPBOX-SO

Collection Date: 2/12/2015 1:50:00 PM

Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: CK
o-Xylene	2360	1000		µg/Kg	100	2/17/2015 2:27:00 PM
sec-Butylbenzene	13.1	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Styrene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
tert-Butylbenzene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Tetrachloroethene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Toluene	197	100		µg/Kg	10	2/17/2015 3:00:00 PM
trans-1,2-Dichloroethene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
trans-1,3-Dichloropropene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Trichloroethene	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Trichlorofluoromethane	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Vinyl chloride	ND	10.0		µg/Kg	1	2/17/2015 3:32:00 PM
Surr: 1,2-Dichloroethane-d4	107	71.5-112		%REC	1	2/17/2015 3:32:00 PM
Surr: 4-Bromofluorobenzene	95.8	75.7-122		%REC	1	2/17/2015 3:32:00 PM
Surr: Dibromofluoromethane	97.9	64.3-124		%REC	1	2/17/2015 3:32:00 PM
Surr: Toluene-d8	112	74.9-120		%REC	1	2/17/2015 3:32:00 PM
CYANIDE		SW9012B				Analyst: EFH
Cyanide, Total	0.423	0.0200		mg/Kg	1	2/18/2015 11:22:45 AM

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: ICV	SampType: ICV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:	RunNo: 18928						
Client ID: ICV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015	SeqNo: 251085						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.6	0.100	50.00	0	99.1	90	110				
Barium, TCLP	47.9	1.00	50.00	0	95.7	90	110				
Cadmium, TCLP	47.9	0.100	50.00	0	95.8	90	110				
Chromium, TCLP	50.2	0.100	50.00	0	100	90	110				
Lead, TCLP	47.8	0.100	50.00	0	95.6	90	110				
Selenium, TCLP	52.1	1.00	50.00	0	104	90	110				
Silver, TCLP	47.8	0.100	50.00	0	95.6	90	110				

Sample ID: CCV	SampType: CCV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:	RunNo: 18928						
Client ID: CCV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015	SeqNo: 251087						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	48.7	0.100	50.00	0	97.5	90	110				
Barium, TCLP	48.9	1.00	50.00	0	97.8	90	110				
Cadmium, TCLP	50.0	0.100	50.00	0	100	90	110				
Chromium, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Lead, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Selenium, TCLP	47.5	1.00	50.00	0	95.0	90	110				
Silver, TCLP	50.1	0.100	50.00	0	100	90	110				

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 1 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: MB-8938	SampType: MBLK	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: PBW	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015	SeqNo: 251089						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	ND	0.100									
Barium, TCLP	ND	1.00									
Cadmium, TCLP	ND	0.100									
Chromium, TCLP	ND	0.100									
Lead, TCLP	ND	0.100									
Selenium, TCLP	ND	1.00									
Silver, TCLP	ND	0.100									

Sample ID: LCS-8938	SampType: LCS	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: LCSW	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015	SeqNo: 251090						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	45.8	0.100	50.00	0	91.6	80	120				
Barium, TCLP	50.5	1.00	50.00	0	101	80	120				
Cadmium, TCLP	50.3	0.100	50.00	0	101	80	120				
Chromium, TCLP	46.5	0.100	50.00	0	93.1	80	120				
Lead, TCLP	50.3	0.100	50.00	0	101	80	120				
Selenium, TCLP	44.5	1.00	50.00	0	88.9	80	120				
Silver, TCLP	51.0	0.100	50.00	0	102	80	120				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: A1502141-001BDUP	SampType: DUP	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: ZZZZZZ	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015	SeqNo: 251093						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	30.4	0.100						30.72	1.15	20	
Barium, TCLP	23.6	1.00						32.63	32.2	20	R
Cadmium, TCLP	ND	0.100						0	0	20	
Chromium, TCLP	ND	0.100						0.1058	200	20	RF
Lead, TCLP	0.115	0.100						0.1273	10.4	20	
Selenium, TCLP	ND	1.00						0	0	20	
Silver, TCLP	ND	0.100						0	0	20	

Sample ID: ICV	SampType: ICV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:	RunNo: 18928						
Client ID: ICV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015	SeqNo: 251363						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.1	0.100	50.00	0	98.1	90	110				
Barium, TCLP	48.5	1.00	50.00	0	97.1	90	110				
Cadmium, TCLP	48.5	0.100	50.00	0	97.0	90	110				
Chromium, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Lead, TCLP	47.5	0.100	50.00	0	95.0	90	110				
Selenium, TCLP	49.1	1.00	50.00	0	98.2	90	110				
Silver, TCLP	47.0	0.100	50.00	0	94.0	90	110				

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 3 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: A1502141-001BMS	SampType: MS	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: ZZZZZZ	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015	SeqNo: 251368						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	78.2	0.100	50.00	30.72	94.9	70	130				
Barium, TCLP	70.7	1.00	50.00	32.63	76.2	70	130				
Cadmium, TCLP	48.7	0.100	50.00	0.01392	97.4	70	130				
Chromium, TCLP	44.7	0.100	50.00	0.1058	89.2	70	130				
Lead, TCLP	48.8	0.100	50.00	0.1273	97.3	70	130				
Selenium, TCLP	44.4	1.00	50.00	0	88.8	70	130				
Silver, TCLP	47.3	0.100	50.00	0	94.7	70	130				

Sample ID: A1502141-001BMSD	SampType: MSD	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: ZZZZZZ	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015	SeqNo: 251369						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	76.7	0.100	50.00	30.72	92.0	70	130	78.16	1.86	20	
Barium, TCLP	68.5	1.00	50.00	32.63	71.8	70	130	70.72	3.17	20	
Cadmium, TCLP	48.1	0.100	50.00	0.01392	96.3	70	130	48.71	1.18	20	
Chromium, TCLP	43.4	0.100	50.00	0.1058	86.6	70	130	44.73	3.02	20	
Lead, TCLP	47.2	0.100	50.00	0.1273	94.1	70	130	48.78	3.33	20	
Selenium, TCLP	44.4	1.00	50.00	0	88.8	70	130	44.38	0.0225	20	
Silver, TCLP	46.6	0.100	50.00	0	93.2	70	130	47.33	1.58	20	

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 4 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: CCV	SampType: CCV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:	RunNo: 18928						
Client ID: CCV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015	SeqNo: 251373						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	48.4	0.100	50.00	0	96.7	90	110				
Barium, TCLP	49.5	1.00	50.00	0	99.1	90	110				
Cadmium, TCLP	49.4	0.100	50.00	0	98.7	90	110				
Chromium, TCLP	46.9	0.100	50.00	0	93.9	90	110				
Lead, TCLP	48.7	0.100	50.00	0	97.4	90	110				
Selenium, TCLP	47.7	1.00	50.00	0	95.4	90	110				
Silver, TCLP	47.9	0.100	50.00	0	95.8	90	110				

Sample ID: CCV	SampType: CCV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:				RunNo: 18928			
Client ID: CCV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015				SeqNo: 251384			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.1	0.100	50.00	0	98.2	90	110				
Barium, TCLP	49.8	1.00	50.00	0	99.6	90	110				
Cadmium, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Chromium, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Lead, TCLP	48.6	0.100	50.00	0	97.2	90	110				
Selenium, TCLP	49.6	1.00	50.00	0	99.1	90	110				
Silver, TCLP	48.2	0.100	50.00	0	96.4	90	110				

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 5 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_S

Sample ID: CCV MSVWS-2015	SampType: CCV	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: CCV	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250319						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	77.7	10.0	80.00	0	97.2	80	120				
1,2-Dichloropropane	75.7	10.0	80.00	0	94.6	80	120				
Chloroform	79.2	10.0	80.00	0	99.0	80	120				
Ethylbenzene	92.4	10.0	80.00	0	115	80	120				
Toluene	67.8	10.0	80.00	0	84.8	80	120				
Vinyl chloride	76.9	10.0	80.00	0	96.1	80	120				

Sample ID: LCS MSVWS-2016	SampType: LCS	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: LCSS	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250320						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	35.5	10.0	40.00	0	88.8	85.1	136				
Benzene	40.3	10.0	40.00	0	101	87.5	130				
Chlorobenzene	43.1	10.0	40.00	0	108	84.4	130				
Toluene	34.4	10.0	40.00	0	86.1	83.7	127				
Trichloroethene	40.6	10.0	40.00	0	102	88.5	123				

Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: PBS	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250321						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	10.0									
1,1,1-Trichloroethane	ND	10.0									

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 6 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_S

Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: PBS	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250321						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,2,2-Tetrachloroethane	ND	10.0									
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0									
1,1,2-Trichloroethane	ND	10.0									
1,1-Dichloroethane	ND	10.0									
1,1-Dichloroethene	ND	10.0									
1,1-Dichloropropene	ND	10.0									
1,2,3-Trichlorobenzene	ND	10.0									
1,2,3-Trichloropropane	ND	10.0									
1,2,4-Trichlorobenzene	ND	10.0									
1,2,4-Trimethylbenzene	ND	10.0									
1,2-Dibromo-3-chloropropane	ND	10.0									
1,2-Dibromoethane	ND	10.0									
1,2-Dichlorobenzene	ND	10.0									
1,2-Dichloroethane	ND	10.0									
1,2-Dichloropropane	ND	10.0									
1,3,5-Trimethylbenzene	ND	10.0									
1,3-Dichlorobenzene	ND	10.0									
1,3-Dichloropropane	ND	10.0									
1,4-Dichlorobenzene	ND	10.0									
2,2-Dichloropropane	ND	10.0									
2-Butanone	ND	20.0									
2-Chlorotoluene	ND	10.0									
2-Hexanone	ND	20.0									
4-Chlorotoluene	ND	10.0									
4-Isopropyltoluene	ND	10.0									
4-Methyl-2-pentanone	ND	20.0									

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_S

Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: PBS	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250321						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acetone	ND	50.0									
Benzene	ND	10.0									
Bromobenzene	ND	10.0									
Bromochloromethane	ND	10.0									
Bromodichloromethane	ND	10.0									
Bromoform	ND	10.0									
Bromomethane	ND	10.0									
Carbon disulfide	ND	10.0									
Carbon tetrachloride	ND	10.0									
Chlorobenzene	ND	10.0									
Chloroethane	ND	10.0									
Chloroform	ND	10.0									
Chloromethane	ND	10.0									
cis-1,2-Dichloroethene	ND	10.0									
cis-1,3-Dichloropropene	ND	10.0									
Dibromochloromethane	ND	10.0									
Dibromomethane	ND	10.0									
Dichlorodifluoromethane	ND	10.0									
Ethylbenzene	ND	10.0									
Hexachlorobutadiene	ND	10.0									
Isopropylbenzene	ND	10.0									
m,p-Xylene	ND	20.0									
Methyl tert-butyl ether	ND	10.0									
Methylene chloride	ND	50.0									
Naphthalene	ND	10.0									
n-Butylbenzene	ND	10.0									

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit	Page 8 of 28
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery	

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_S

Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: PBS	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250321						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Propylbenzene	ND	10.0									
o-Xylene	ND	10.0									
sec-Butylbenzene	ND	10.0									
Styrene	ND	10.0									
tert-Butylbenzene	ND	10.0									
Tetrachloroethene	ND	10.0									
Toluene	ND	10.0									
trans-1,2-Dichloroethene	ND	10.0									
trans-1,3-Dichloropropene	ND	10.0									
Trichloroethene	ND	10.0									
Trichlorofluoromethane	ND	10.0									
Vinyl chloride	ND	10.0									
Surr: 1,2-Dichloroethane-d4	90.8		100.0		90.8	71.5	112				
Surr: 4-Bromofluorobenzene	96.7		100.0		96.7	75.7	122				
Surr: Dibromofluoromethane	94.8		100.0		94.8	64.3	124				
Surr: Toluene-d8	107		100.0		107	74.9	120				

Sample ID: 1502116-001AMS	SampType: MS	TestCode: 8260_S	Units: µg/Kg	Prep Date: 2/16/2015	RunNo: 18895						
Client ID: ZZZZZZ	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250325						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	42800	10000	40000	0	107	46.6	147				
Benzene	42600	10000	40000	0	107	65.2	121				
Chlorobenzene	45600	10000	40000	0	114	40.9	122				

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_S

Sample ID: 1502116-001AMS	SampType: MS	TestCode: 8260_S	Units: µg/Kg	Prep Date: 2/16/2015	RunNo: 18895						
Client ID: ZZZZZZ	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250325						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	47000	10000	40000	5600	103	52.1	127				
Trichloroethene	44300	10000	40000	0	111	57.6	122				

Sample ID: 1502116-001AMSD	SampType: MSD	TestCode: 8260_S	Units: µg/Kg	Prep Date: 2/16/2015	RunNo: 18895						
Client ID: ZZZZZZ	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/16/2015	SeqNo: 250326						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	49600	10000	40000	0	124	46.6	147	42790	14.6	30	
Benzene	42500	10000	40000	0	106	65.2	121	42610	0.235	30	
Chlorobenzene	43000	10000	40000	0	108	40.9	122	45570	5.69	30	
Toluene	48000	10000	40000	5600	106	52.1	127	46970	2.11	30	
Trichloroethene	45500	10000	40000	0	114	57.6	122	44330	2.67	30	

Sample ID: CCV MSVWS-2015	SampType: CCV	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: CCV	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/17/2015	SeqNo: 250786						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	39.8	10.0	40.00	0	99.4	80	120				
1,2-Dichloropropane	41.2	10.0	40.00	0	103	80	120				
Chloroform	44.0	10.0	40.00	0	110	80	120				
Ethylbenzene	44.6	10.0	40.00	0	112	80	120				
Toluene	33.9	10.0	40.00	0	84.6	80	120				
Vinyl chloride	34.1	10.0	40.00	0	85.3	80	120				

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 10 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_S

Sample ID: CCV MSVWS-2015	SampType: CCV	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: CCV	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/17/2015	SeqNo: 250786						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: CCB	SampType: CCB	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: 18895						
Client ID: CCB	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/17/2015	SeqNo: 250787						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,1,1,2-Tetrachloroethane	ND	10.0
1,1,1-Trichloroethane	ND	10.0
1,1,2,2-Tetrachloroethane	ND	10.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0
1,1,2-Trichloroethane	ND	10.0
1,1-Dichloroethane	ND	10.0
1,1-Dichloroethene	ND	10.0
1,1-Dichloropropene	ND	10.0
1,2,3-Trichlorobenzene	ND	10.0
1,2,3-Trichloropropane	ND	10.0
1,2,4-Trichlorobenzene	ND	10.0
1,2,4-Trimethylbenzene	ND	10.0
1,2-Dibromo-3-chloropropane	ND	10.0
1,2-Dibromoethane	ND	10.0
1,2-Dichlorobenzene	ND	10.0
1,2-Dichloroethane	ND	10.0
1,2-Dichloropropane	ND	10.0
1,3,5-Trimethylbenzene	ND	10.0
1,3-Dichlorobenzene	ND	10.0

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 11 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_S

Sample ID: CCB	SampType: CCB	TestCode: 8260_S		Units: µg/Kg	Prep Date:				RunNo: 18895		
Client ID: CCB	Batch ID: 8936	TestNo: SW8260B		5030	Analysis Date: 2/17/2015				SeqNo: 250787		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,3-Dichloropropane	ND	10.0									
1,4-Dichlorobenzene	ND	10.0									
2,2-Dichloropropane	ND	10.0									
2-Butanone	ND	20.0									
2-Chlorotoluene	ND	10.0									
2-Hexanone	ND	20.0									
4-Chlorotoluene	ND	10.0									
4-Isopropyltoluene	ND	10.0									
4-Methyl-2-pentanone	ND	20.0									
Acetone	ND	50.0									
Benzene	ND	10.0									
Bromobenzene	ND	10.0									
Bromochloromethane	ND	10.0									
Bromodichloromethane	ND	10.0									
Bromoform	ND	10.0									
Bromomethane	ND	10.0									
Carbon disulfide	ND	10.0									
Carbon tetrachloride	ND	10.0									
Chlorobenzene	ND	10.0									
Chloroethane	ND	10.0									
Chloroform	ND	10.0									
Chloromethane	ND	10.0									
cis-1,2-Dichloroethene	ND	10.0									
cis-1,3-Dichloropropene	ND	10.0									
Dibromochloromethane	ND	10.0									
Dibromomethane	ND	10.0									

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_S

Sample ID: CCB	SampType: CCB	TestCode: 8260_S		Units: µg/Kg	Prep Date:				RunNo: 18895		
Client ID: CCB	Batch ID: 8936	TestNo: SW8260B		5030	Analysis Date: 2/17/2015				SeqNo: 250787		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane	ND	10.0									
Ethylbenzene	ND	10.0									
Hexachlorobutadiene	ND	10.0									
Isopropylbenzene	ND	10.0									
m,p-Xylene	ND	20.0									
Methyl tert-butyl ether	ND	10.0									
Methylene chloride	ND	50.0									
Naphthalene	ND	10.0									
n-Butylbenzene	ND	10.0									
n-Propylbenzene	ND	10.0									
o-Xylene	ND	10.0									
sec-Butylbenzene	ND	10.0									
Styrene	ND	10.0									
tert-Butylbenzene	ND	10.0									
Tetrachloroethene	ND	10.0									
Toluene	ND	10.0									
trans-1,2-Dichloroethene	ND	10.0									
trans-1,3-Dichloropropene	ND	10.0									
Trichloroethene	ND	10.0									
Trichlorofluoromethane	ND	10.0									
Vinyl chloride	ND	10.0									
Surr: 1,2-Dichloroethane-d4	104		100.0		104	71.5	112				
Surr: 4-Bromofluorobenzene	97.0		100.0		97.0	75.7	122				
Surr: Dibromofluoromethane	110		100.0		110	64.3	124				
Surr: Toluene-d8	102		100.0		102	74.9	120				

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit	Page 13 of 28
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery	

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL_S

Sample ID: CCV-8941	SampType: CCV	TestCode: 8270LL_S	Units: µg/Kg	Prep Date:	RunNo: 18926						
Client ID: CCV	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250892						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,4-Dichlorobenzene	1120	33.3	1333	0	84.2	80	120				
2,4,6-Trichlorophenol	1490	33.3	1333	0	112	80	120				
2,4-Dichlorophenol	1440	33.3	1333	0	108	80	120				
2-Nitrophenol	1520	167	1333	0	114	80	120				
4-Chloro-3-methylphenol	1530	33.3	1333	0	115	80	120				
Acenaphthene	1580	33.3	1333	0	118	80	120				
Benzo(a)pyrene	1560	33.3	1333	0	117	80	120				
Di-n-octyl phthalate	1550	33.3	1333	0	117	80	120				
Fluoranthene	1580	33.3	1333	0	119	80	120				
Hexachlorobutadiene	1500	33.3	1333	0	112	80	120				
N-Nitrosodiphenylamine	1510	33.3	1333	0	113	80	120				
Pentachlorophenol	1080	50.0	1333	0	80.9	80	120				
Phenol	1580	33.3	1333	0	119	80	120				

Sample ID: LCS-8941	SampType: LCS	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: LCSS	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250893						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	1320	33.3	1667	0	79.2	30.9	106				
1,4-Dichlorobenzene	1130	33.3	1667	0	68.0	31.4	98.2				
2,4-Dinitrotoluene	1330	33.3	1667	0	79.6	59.7	111				
2-Chlorophenol	1390	33.3	1667	0	83.7	46.2	105				
4-Chloro-3-methylphenol	1810	33.3	1667	0	109	47.4	114				
4-Nitrophenol	1940	167	1667	0	116	45.3	114				SO

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 14 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL_S

Sample ID: LCS-8941	SampType: LCS	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: LCSS	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250893						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1600	33.3	1667	0	95.8	48.2	105				SO
N-Nitrosodi-n-propylamine	1690	33.3	1667	0	102	42.4	101				
Pentachlorophenol	843	50.0	1667	0	50.6	46.8	120				
Phenol	1600	33.3	1667	0	95.9	51.1	103				
Pyrene	1390	33.3	1667	0	83.2	56.7	130				

Sample ID: MB-8941	SampType: MBLK	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: PBS	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250894						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	ND	33.3									
1,2-Dichlorobenzene	ND	33.3									
1,2-Diphenylhydrazine	ND	167									
1,3-Dichlorobenzene	ND	33.3									
1,4-Dichlorobenzene	ND	33.3									
1-Methylnaphthalene	ND	33.3									
2,4,5-Trichlorophenol	ND	33.3									
2,4,6-Trichlorophenol	ND	33.3									
2,4-Dichlorophenol	ND	33.3									
2,4-Dimethylphenol	ND	33.3									
2,4-Dinitrophenol	ND	333									
2,4-Dinitrotoluene	ND	33.3									
2,6-Dinitrotoluene	ND	33.3									
2-Chloronaphthalene	ND	33.3									

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit	Page 15 of 28
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery	

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL_S

Sample ID: MB-8941	SampType: MBLK	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: PBS	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250894						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Chlorophenol	ND	33.3									
2-Methylnaphthalene	ND	33.3									
2-Methylphenol	ND	33.3									
2-Nitroaniline	ND	33.3									
2-Nitrophenol	ND	167									
3-&4-Methylphenol	ND	33.3									
3,3-Dichlorobenzidine	ND	167									
3-Nitroaniline	ND	33.3									
4,6-Dinitro-2-methylphenol	ND	167									
4-Bromophenyl phenyl ether	ND	33.3									
4-Chloro-3-methylphenol	ND	33.3									
4-Chloroaniline	ND	33.3									
4-Chlorophenyl phenyl ether	ND	33.3									
4-Nitroaniline	ND	33.3									
4-Nitrophenol	ND	167									
Acenaphthene	ND	33.3									
Acenaphthylene	ND	33.3									
Aniline	ND	33.3									
Anthracene	ND	33.3									
Benz(a)anthracene	ND	33.3									
Benzidine	ND	167									
Benzo(a)pyrene	ND	33.3									
Benzo(b)fluoranthene	ND	33.3									
Benzo(g,h,i)perylene	ND	33.3									
Benzo(k)fluoranthene	ND	33.3									
Benzoic Acid	ND	667									

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit	Page 16 of 28
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery	

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL_S

Sample ID: MB-8941	SampType: MBLK	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: PBS	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250894						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzyl Alcohol	ND	33.3									
Benzyl butyl phthalate	ND	33.3									
Bis(2-chloroethoxy)methane	ND	33.3									
Bis(2-chloroethyl)ether	ND	33.3									
Bis(2-chloroisopropyl)ether	ND	33.3									
Bis(2-ethylhexyl)phthalate	ND	33.3									
Carbazole	ND	33.3									
Chrysene	ND	33.3									
Dibenz(a,h)anthracene	ND	33.3									
Dibenzofuran	ND	33.3									
Diethyl phthalate	ND	33.3									
Dimethyl phthalate	ND	33.3									
Di-n-butyl phthalate	ND	50.0									
Di-n-octyl phthalate	ND	33.3									
Fluoranthene	ND	33.3									
Fluorene	ND	33.3									
Hexachlorobenzene	ND	33.3									
Hexachlorobutadiene	ND	33.3									
Hexachlorocyclopentadiene	ND	33.3									
Hexachloroethane	ND	33.3									
Indeno(1,2,3-cd)pyrene	ND	33.3									
Isophorone	ND	33.3									
Naphthalene	ND	33.3									
Nitrobenzene	ND	33.3									
N-Nitrosodimethylamine	ND	33.3									
N-Nitrosodi-n-propylamine	ND	33.3									

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit	Page 17 of 28
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery	

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL_S

Sample ID: MB-8941	SampType: MBLK	TestCode: 8270LL_S		Units: µg/Kg	Prep Date: 2/17/2015				RunNo: 18926		
Client ID: PBS	Batch ID: 8941	TestNo: SW8270D		SW 3545A	Analysis Date: 2/18/2015				SeqNo: 250894		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
N-Nitrosodiphenylamine	ND	33.3									
Pentachlorophenol	ND	50.0									
Phenanthrene	ND	33.3									
Phenol	ND	33.3									
Pyrene	ND	33.3									
Pyridine	ND	167									
Surr: 2,4,6-Tribromophenol	2950		3333		88.6	57.8	119				
Surr: 2-Fluorobiphenyl	2710		3333		81.3	52.6	93.2				
Surr: 2-Fluorophenol	3590		3333		108	40.7	111				
Surr: 4-Terphenyl-d14	2720		3333		81.6	49.8	118				
Surr: Nitrobenzene-d5	3460		3333		104	44.8	103				S
Surr: Phenol-d6	3380		3333		102	47.5	117				

Sample ID: 1502126-002BMS	SampType: MS	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: ZZZZZZ	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250895						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	1040	33.3	1667	0	62.7	31.1	92.7				
1,4-Dichlorobenzene	1220	33.3	1667	0	73.1	16.5	85.6				
2,4-Dinitrotoluene	1070	33.3	1667	13.00	63.6	43.4	118				
2-Chlorophenol	968	33.3	1667	0	58.1	36.8	103				
4-Chloro-3-methylphenol	1620	33.3	1667	0	96.9	49.5	119				
4-Nitrophenol	1430	167	1667	0	86.0	45	111				
Acenaphthene	1170	33.3	1667	31.67	68.4	45.1	102				

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 18 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL_S

Sample ID: 1502126-002BMS	SampType: MS	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: ZZZZZZ	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250895						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
N-Nitrosodi-n-propylamine	1180	33.3	1667	0	71.1	45.6	94.1				
Pentachlorophenol	635	50.0	1667	0	38.1	36.6	112				
Phenol	1470	33.3	1667	0	88.4	37.7	107				
Pvrene	945	33.3	1667	157.7	47.2	42.4	131				

Sample ID: 1502126-002BMSD	SampType: MSD	TestCode: 8270LL_S	Units: µg/Kg	Prep Date: 2/17/2015	RunNo: 18926						
Client ID: ZZZZZZ	Batch ID: 8941	TestNo: SW8270D	SW 3545A	Analysis Date: 2/18/2015	SeqNo: 250896						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	1220	33.3	1667	0	73.0	31.1	92.7	1044	15.3	20	
1,4-Dichlorobenzene	1260	33.3	1667	0	75.6	16.5	85.6	1218	3.42	20	
2,4-Dinitrotoluene	1190	33.3	1667	13.00	70.5	43.4	118	1072	10.2	20	
2-Chlorophenol	1250	33.3	1667	0	74.9	36.8	103	968.3	25.3	20	R
4-Chloro-3-methylphenol	1610	33.3	1667	0	96.9	49.5	119	1616	0.0826	20	
4-Nitrophenol	1920	167	1667	0	115	45	111	1434	28.8	20	SR
Acenaphthene	1570	33.3	1667	31.67	92.4	45.1	102	1172	29.1	20	R
N-Nitrosodi-n-propylamine	1540	33.3	1667	0	92.6	45.6	94.1	1185	26.3	20	R
Pentachlorophenol	834	50.0	1667	0	50.0	36.6	112	635.0	27.1	20	R
Phenol	1820	33.3	1667	0	109	37.7	107	1474	20.9	20	SR
Pyrene	1650	33.3	1667	157.7	89.8	42.4	131	945.0	54.6	20	R

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: CN_S

Sample ID: R18935ICV		SampType: ICV		TestCode: CN_S		Units: mg/Kg		Prep Date:		RunNo: 18935			
Client ID: ICV		Batch ID: R18935		TestNo: SW9012B				Analysis Date: 2/18/2015		SeqNo: 251075			
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide, Total 0.323 0.0200 0.3000 0 108 90 110

Sample ID: MB-R18935	SampType: MBLK	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: PBS	Batch ID: R18935	TestNo: SW9012B		Analysis Date: 2/18/2015	SeqNo: 251076						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide, Total ND 0.0200

Sample ID: LCS-R18935	SampType: LCS	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: LCSS	Batch ID: R18935	TestNo: SW9012B	Analysis Date: 2/18/2015	SeqNo: 251077							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide, Total 0.227 0.0200 0.2000 0 114 85 115

Sample ID: R18935CCV	SampType: CCV	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: CCV	Batch ID: R18935	TestNo: SW9012B		Analysis Date: 2/18/2015	SeqNo: 251078						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide, Total 0.368 0.0200 0.3500 0 105 90 110

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 20 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: CN_S

Sample ID: 1502126-001BMS	SampType: MS	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: ZZZZZZ	Batch ID: R18935	TestNo: SW9012B	Analysis Date: 2/18/2015	SeqNo: 251082							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	1.08	0.100	0.1000	1.006	70.5	80	120				SMC

Sample ID: 1502126-001BMSD	SampType: MSD	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: ZZZZZZ	Batch ID: R18935	TestNo: SW9012B	Analysis Date: 2/18/2015	SeqNo: 251083							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	1.04	0.100	0.1000	1.006	32.5	80	120	1.076	3.59	20	SMC

Sample ID: R18935CCV	SampType: CCV	TestCode: CN_S	Units: mg/Kg	Prep Date:	RunNo: 18935						
Client ID: CCV	Batch ID: R18935	TestNo: SW9012B	Analysis Date: 2/18/2015	SeqNo: 251084							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.381	0.0200	0.3500	0	109	90	110				

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: HG_CT

Sample ID: MB-8944	SampType: MBLK	TestCode: HG_CT	Units: mg/L	Prep Date: 2/17/2015	RunNo: 18910						
Client ID: PBW	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250577						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury, TCLP ND 0.000100

Sample ID: LCS-8944	SampType: LCS	TestCode: HG_CT	Units: mg/L	Prep Date: 2/17/2015	RunNo: 18910						
Client ID: LCSW	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250578						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury, TCLP 0.00379 0.000100 0.004000 0 94.7 85.4 116

Sample ID: 1502126-002BMS	SampType: MS	TestCode: HG_CT	Units: mg/L	Prep Date: 2/17/2015	RunNo: 18910						
Client ID: ZZZZZZ	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250584						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury, TCLP 0.00407 0.000100 0.004000 0 102 69.5 125

Sample ID: 1502126-002BMSD	SampType: MSD	TestCode: HG_CT	Units: mg/L	Prep Date: 2/17/2015	RunNo: 18910						
Client ID: ZZZZZZ	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250585						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury, TCLP 0.00382 0.000100 0.004000 0 95.5 69.5 125 0.004069 6.31 20

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 22 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: HG_CT

Sample ID: CCV	SampType: CCV	TestCode: HG_CT	Units: mg/L	Prep Date:	RunNo: 18910						
Client ID: CCV	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250588						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury, TCLP	0.00371	0.000100	0.004000	0	92.8	90	110				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: NWTPHDX_S

Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date:	RunNo: 18906						
Client ID: CCV	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/16/2015	SeqNo: 250542						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	1400	15.0	1332	0	105	85	115				
Lube Oil	731	50.0	666.0	0	110	85	115				

Sample ID: MB-8931	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 2/16/2015	RunNo: 18906						
Client ID: PBS	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/16/2015	SeqNo: 250543						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	28.9		33.33		86.6	50	150				

Sample ID: LCS-8931	SampType: LCS	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 2/16/2015	RunNo: 18906						
Client ID: LCSS	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/16/2015	SeqNo: 250544						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	159	15.0	166.7	0	95.3	76.3	125				
Lube Oil	128	50.0	166.7	0	76.7	69.9	127				

Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date:	RunNo: 18906						
Client ID: CCV	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/17/2015	SeqNo: 250546						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 24 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: NWTPHDX_S

Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date:	RunNo: 18906						
Client ID: CCV	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/17/2015	SeqNo: 250546						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	1050	15.0	999.0	0	105	85	115				
Lube Oil	529	50.0	499.5	0	106	85	115				

Sample ID: CCB	SampType: CCB	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date:	RunNo: 18906						
Client ID: CCB	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/17/2015	SeqNo: 250547						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	28.5		33.30		85.5	50	150				

Sample ID: 1502131-001ADUP	SampType: DUP	TestCode: NWTPHDX_S	Units: mg/Kg-dry	Prep Date: 2/16/2015	RunNo: 18906						
Client ID: DROPBOX-SO	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/17/2015	SeqNo: 250551						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	1160	20.9						878.4	27.7	20	RA1
Lube Oil	334	69.5						229.1	37.3	20	RA2

Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date:	RunNo: 18906						
Client ID: CCV	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/17/2015	SeqNo: 250556						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 25 of 28
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: NWTPHDX_S

Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date:	RunNo: 18906						
Client ID: CCV	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A	Analysis Date: 2/17/2015	SeqNo: 250556						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	1430	15.0	1332	0	107	85	115				
Lube Oil	732	50.0	666.0	0	110	85	115				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: NWTPHGX_S

Sample ID: CCV	SampType: CCV	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date:	RunNo: 18950						
Client ID: CCV	Batch ID: 8937	TestNo: NWTPH-Gx	5030_G_S	Analysis Date: 2/19/2015	SeqNo: 251411						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	100	2.50	100.0	0	100	80	120				
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Sample ID: MB-8937	SampType: MBLK	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date: 2/17/2015	RunNo: 18950						
Client ID: PBS	Batch ID: 8937	TestNo: NWTPH-Gx	5030_G_S	Analysis Date: 2/19/2015	SeqNo: 251412						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	2.50									
Surr: 4-Bromofluorobenzene	4.06		5.000		81.2	50	150				

Sample ID: LCS-8937	SampType: LCS	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date: 2/17/2015	RunNo: 18950						
Client ID: LCSS	Batch ID: 8937	TestNo: NWTPH-Gx	5030_G_S	Analysis Date: 2/19/2015	SeqNo: 251413						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	58.3	2.50	50.00	0	117	53.5	121				
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Sample ID: 1502126-001ADUP	SampType: DUP	TestCode: NWTPHGX_S	Units: mg/Kg-dry	Prep Date: 2/17/2015	RunNo: 18950						
Client ID: ZZZZZZ	Batch ID: 8937	TestNo: NWTPH-Gx	5030_G_S	Analysis Date: 2/19/2015	SeqNo: 251495						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	78.5	3.49						21.34	115	20	RMI
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Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit	Page 27 of 28
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery	

QC SUMMARY REPORT

WO#: 1502131

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: NWTPHGX_S

Sample ID: CCV	SampType: CCV	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date:	RunNo: 18950						
Client ID: CCV	Batch ID: 8937	TestNo: NWTPH-Gx	5030_G_S	Analysis Date: 2/20/2015	SeqNo: 251509						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	136	2.50	125.0	0	109	80	120				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

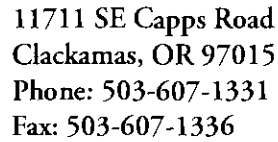
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

KEY TO FLAGS

Rev. May 12, 2010

- A This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
- A1 This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
- A2 This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
- A3 The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
- A4 The product appears to be aged or degraded diesel.
- B The blank exhibited a positive result great than the reporting limit for this compound.
- CN See Case Narrative.
- D Result is based from a dilution.
- E Result exceeds the calibration range for this compound. The result should be considered as estimate.
- F The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
- G Result may be biased high due to biogenic interferences. Clean up is recommended.
- H Sample was analyzed outside recommended holding time.
- HT At clients request, samples was analyzed outside of recommended holding time.
- J The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
- K Diesel result is biased high due to amount of Oil contained in the sample.
- L Diesel result is biased high due to amount of Gasoline contained in the sample.
- M Oil result is biased high due to amount of Diesel contained in the sample.
- MC Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
- MI Result is outside control limits due to matrix interference.
- MSA Value determined by Method of Standard Addition.
- O Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
- Q Detection levels elevated due to sample matrix.
- R RPD control limits were exceeded.
- RF Duplicate failed due to result being at or near the method-reporting limit.
- RP Matrix spike values exceed established QC limits; post digestion spike is in control.
- S Recovery is outside control limits.
- SC Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
- * The result for this parameter was greater than the maximum contaminant level of the TCLP regulatory limit.

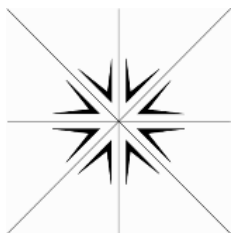
Page 1 of 1



Contact Person/Project Manager James Peale
Company Maul Foster & Alongi, Inc.
Address 2001 NW 19th Avenue, Suite 200
Portland, OR 97209
Phone 971-544-2139 Fax 971-544-2140
Project No. 8123.01.08/08 Project Name _____
Project Site Location OR ☒ WA _____ Other _____
Invoice To MFA P.O. No. _____

Rush Analyses Must Be Scheduled With The Lab In Advance

[illegible]



Specialty Analytical

11711 SE Capps Road, Ste B
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

February 20, 2015

James Peale
Maul Foster & Alongi
400 E. Mill Plain Blvd.
Suite 400
Vancouver, WA 98660
TEL: (360) 694-2691
FAX (360) 906-1958
RE: Siltronic / 8128.01.08/08

Dear James Peale:

Order No.: 1502132

Specialty Analytical received 2 sample(s) on 2/13/2015 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read "Marty French".

Marty French
Lab Director

Specialty Analytical

Date Reported: 20-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08
Lab ID: 1502132-001
Client Sample ID: TOTES-COMP-W

Collection Date: 2/12/2015 4:30:00 PM

Matrix: WATER

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
NWTPH-DX - RBC		NWTPH-DX				Analyst: BS
Diesel	41.8	1.55	A1	mg/L	20	2/16/2015 6:13:01 PM
Lube Oil	14.5	3.88	A2	mg/L	20	2/16/2015 6:13:01 PM
Surr: o-Terphenyl	4.80	50-150	SMI	%REC	20	2/16/2015 6:13:01 PM
NWTPH-GX		NWTPH-GX				Analyst: BS
Gasoline	12600	200		µg/L	2	2/19/2015 10:59:35 AM
Surr: 4-Bromofluorobenzene	2.92	50-150	SMI	%REC	2	2/19/2015 10:59:35 AM
TCLP 8 ICP/MS METALS-TCLP LEACHED		E1311/6020				Analyst: KP
Arsenic, TCLP	15.0	5.00		µg/L	1	2/19/2015 5:34:00 PM
Barium, TCLP	720	50.0		µg/L	1	2/19/2015 5:34:00 PM
Cadmium, TCLP	ND	5.00		µg/L	1	2/19/2015 5:34:00 PM
Chromium, TCLP	54.0	5.00		µg/L	1	2/19/2015 5:34:00 PM
Lead, TCLP	77.2	5.00		µg/L	1	2/19/2015 5:34:00 PM
Selenium, TCLP	ND	50.0		µg/L	1	2/19/2015 5:34:00 PM
Silver, TCLP	ND	5.00		µg/L	1	2/19/2015 5:34:00 PM
TCLP 8 TOTAL MERCURY		E7470A				Analyst: BW
Mercury, TCLP	ND	0.000100		mg/L	1	2/17/2015 3:12:09 PM
SEMIVOLATILE ORGANICS-LOW LEVEL		SW8270D				Analyst: bda
1,2,4-Trichlorobenzene	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
1,2-Dichlorobenzene	ND	3.91	Q	µg/L	4	2/17/2015 11:40:00 AM
1,2-Diphenylhydrazine	ND	48.9	Q	µg/L	10	2/17/2015 1:28:00 PM
1,3-Dichlorobenzene	ND	3.91	Q	µg/L	4	2/17/2015 11:40:00 AM
1,4-Dichlorobenzene	ND	3.91	Q	µg/L	4	2/17/2015 11:40:00 AM
1-Methylnaphthalene	1450	97.8		µg/L	100	2/17/2015 12:59:00 PM
2,3,4-Trichlorophenol	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
2,3,5,6-Tetrachlorophenol	ND	48.9	Q	µg/L	10	2/17/2015 1:28:00 PM
2,3,5-Trichlorophenol	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
2,3,6-Trichlorophenol	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
2,4,5-Trichlorophenol	ND	48.9	Q	µg/L	10	2/17/2015 1:28:00 PM
2,4,6-Trichlorophenol	ND	48.9	Q	µg/L	10	2/17/2015 1:28:00 PM
2,4-Dichlorophenol	ND	29.4	Q	µg/L	10	2/17/2015 1:28:00 PM
2,4-Dimethylphenol	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
2,4-Dinitrophenol	ND	97.8	Q	µg/L	10	2/17/2015 1:28:00 PM
2,4-Dinitrotoluene	ND	48.9	Q	µg/L	10	2/17/2015 1:28:00 PM
2,6-Dinitrotoluene	117	48.9		µg/L	10	2/17/2015 1:28:00 PM
2-Chloronaphthalene	71.1	9.78		µg/L	10	2/17/2015 1:28:00 PM

Specialty Analytical

Date Reported: 20-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08
Lab ID: 1502132-001
Client Sample ID: TOTES-COMP-W

Collection Date: 2/12/2015 4:30:00 PM

Matrix: WATER

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL		SW8270D				Analyst: bda
2-Chlorophenol	ND	3.91	Q	µg/L	4	2/17/2015 11:40:00 AM
2-Methylnaphthalene	2550	97.8		µg/L	100	2/17/2015 12:59:00 PM
2-Methylphenol	ND	7.83	Q	µg/L	4	2/17/2015 11:40:00 AM
2-Nitroaniline	ND	48.9	Q	µg/L	10	2/17/2015 1:28:00 PM
2-Nitrophenol	ND	48.9	Q	µg/L	10	2/17/2015 1:28:00 PM
3-&4-Methylphenol	ND	39.1	Q	µg/L	4	2/17/2015 11:40:00 AM
3,3'-Dichlorobenzidine	ND	19.6	Q	µg/L	4	2/17/2015 11:40:00 AM
3-Nitroaniline	ND	58.7	Q	µg/L	10	2/17/2015 1:28:00 PM
4,6-Dinitro-2-methylphenol	ND	97.8	Q	µg/L	10	2/17/2015 1:28:00 PM
4-Bromophenyl phenyl ether	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
4-Chloro-3-methylphenol	ND	19.6	Q	µg/L	10	2/17/2015 1:28:00 PM
4-Chloroaniline	ND	29.4	Q	µg/L	10	2/17/2015 1:28:00 PM
4-Chlorophenyl phenyl ether	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
4-Nitroaniline	ND	48.9	Q	µg/L	10	2/17/2015 1:28:00 PM
4-Nitrophenol	ND	48.9	Q	µg/L	10	2/17/2015 1:28:00 PM
Acenaphthene	2030	97.8		µg/L	100	2/17/2015 12:59:00 PM
Acenaphthylene	89.5	9.78		µg/L	10	2/17/2015 1:28:00 PM
Anthracene	813	9.78		µg/L	10	2/17/2015 1:28:00 PM
Benz(a)anthracene	454	9.78		µg/L	10	2/17/2015 1:28:00 PM
Benzo(a)pyrene	538	9.78		µg/L	10	2/17/2015 1:28:00 PM
Benzo(b)fluoranthene	459	9.78		µg/L	10	2/17/2015 1:28:00 PM
Benzo(g,h,i)perylene	202	3.91		µg/L	4	2/17/2015 11:40:00 AM
Benzo(k)fluoranthene	73.2	3.91		µg/L	4	2/17/2015 11:40:00 AM
Benzoic Acid	ND	196	Q	µg/L	10	2/17/2015 1:28:00 PM
Benzyl Alcohol	ND	19.6	Q	µg/L	4	2/17/2015 11:40:00 AM
Bis(2-chloroethoxy)methane	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
Bis(2-chloroethyl)ether	ND	7.83	Q	µg/L	4	2/17/2015 11:40:00 AM
Bis(2-chloroisopropyl)ether	ND	3.91	Q	µg/L	4	2/17/2015 11:40:00 AM
Bis(2-ethylhexyl)phthalate	91.7	3.91		µg/L	4	2/17/2015 11:40:00 AM
Butyl benzyl phthalate	ND	3.91	Q	µg/L	4	2/17/2015 11:40:00 AM
Carbazole	327	9.78		µg/L	10	2/17/2015 1:28:00 PM
Chrysene	549	9.78		µg/L	10	2/17/2015 1:28:00 PM
Dibenz(a,h)anthracene	45.5	3.91		µg/L	4	2/17/2015 11:40:00 AM
Dibenzofuran	151	9.78		µg/L	10	2/17/2015 1:28:00 PM
Diethyl phthalate	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
Dimethyl phthalate	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
Di-n-butyl phthalate	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
Di-n-octyl phthalate	ND	3.91	Q	µg/L	4	2/17/2015 11:40:00 AM
Fluoranthene	1760	97.8		µg/L	100	2/17/2015 12:59:00 PM

Specialty Analytical

Date Reported: 20-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08
Lab ID: 1502132-001
Client Sample ID: TOTES-COMP-W

Collection Date: 2/12/2015 4:30:00 PM

Matrix: WATER

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LEVEL		SW8270D		Analyst: bda		
Fluorene	850	9.78		µg/L	10	2/17/2015 1:28:00 PM
Hexachlorobenzene	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
Hexachlorobutadiene	ND	19.6	Q	µg/L	10	2/17/2015 1:28:00 PM
Hexachlorocyclopentadiene	ND	48.9	Q	µg/L	10	2/17/2015 1:28:00 PM
Hexachloroethane	7.95	7.83		µg/L	4	2/17/2015 11:40:00 AM
Indeno(1,2,3-cd)pyrene	151	3.91		µg/L	4	2/17/2015 11:40:00 AM
Isophorone	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
Naphthalene	11000	391		µg/L	400	2/17/2015 12:30:00 PM
Nitrobenzene	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
N-Nitrosodimethylamine	ND	3.91	Q	µg/L	4	2/17/2015 11:40:00 AM
N-Nitrosodi-n-propylamine	ND	7.83	Q	µg/L	4	2/17/2015 11:40:00 AM
N-Nitrosodiphenylamine	ND	9.78	Q	µg/L	10	2/17/2015 1:28:00 PM
Pentachlorophenol	ND	48.9	Q	µg/L	10	2/17/2015 1:28:00 PM
Phenanthrene	4150	97.8		µg/L	100	2/17/2015 12:59:00 PM
Phenol	ND	7.83	Q	µg/L	4	2/17/2015 11:40:00 AM
Pyrene	1840	97.8		µg/L	100	2/17/2015 12:59:00 PM
Pyridine	ND	19.6	Q	µg/L	4	2/17/2015 11:40:00 AM
Surr: 2,4,6-Tribromophenol	7.60	33.1-99.7	SMI	%REC	10	2/17/2015 1:28:00 PM
Surr: 2-Fluorobiphenyl	24.7	33.1-96.2	SMI	%REC	10	2/17/2015 1:28:00 PM
Surr: 2-Fluorophenol	11.8	13.4-57.1	SMI	%REC	4	2/17/2015 11:40:00 AM
Surr: 4-Terphenyl-d14	12.6	41-122	SMI	%REC	4	2/17/2015 11:40:00 AM
Surr: Nitrobenzene-d5	34.2	28.9-99.9		%REC	10	2/17/2015 1:28:00 PM
Surr: Phenol-d6	9.40	10.6-38.5	SMI	%REC	4	2/17/2015 11:40:00 AM
VOLATILE ORGANICS BY GC/MS		SW8260B		Analyst: CK		
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,1,1-Trichloroethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,1,2-Trichloroethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,1-Dichloroethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,1-Dichloroethene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,1-Dichloropropene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,2,3-Trichlorobenzene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,2,3-Trichloropropane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,2,4-Trimethylbenzene	179	10.0		µg/L	10	2/18/2015 5:53:00 PM
1,2-Dibromo-3-chloropropane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,2-Dibromoethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM

Specialty Analytical

Date Reported: 20-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08
Lab ID: 1502132-001
Client Sample ID: TOTES-COMP-W

Collection Date: 2/12/2015 4:30:00 PM

Matrix: WATER

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: CK
1,2-Dichlorobenzene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,2-Dichloroethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,2-Dichloropropane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,3,5-Trimethylbenzene	44.0	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,3-Dichlorobenzene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,3-Dichloropropane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
1,4-Dichlorobenzene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
2,2-Dichloropropane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
2-Butanone	ND	10.0		µg/L	1	2/18/2015 6:58:00 PM
2-Chlorotoluene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
2-Hexanone	ND	10.0		µg/L	1	2/18/2015 6:58:00 PM
4-Chlorotoluene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
4-Isopropyltoluene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
4-Methyl-2-pentanone	ND	20.0		µg/L	1	2/18/2015 6:58:00 PM
Acetone	ND	50.0		µg/L	1	2/18/2015 6:58:00 PM
Acrylonitrile	ND	5.00		µg/L	1	2/18/2015 6:58:00 PM
Benzene	333	3.00		µg/L	10	2/18/2015 5:53:00 PM
Bromobenzene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Bromochloromethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Bromodichloromethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Bromoform	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Bromomethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Carbon disulfide	ND	2.00		µg/L	1	2/18/2015 6:58:00 PM
Carbon tetrachloride	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Chlorobenzene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Chloroethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Chloroform	7.14	1.00		µg/L	1	2/18/2015 6:58:00 PM
Chloromethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
cis-1,2-Dichloroethene	12.4	1.00		µg/L	1	2/18/2015 6:58:00 PM
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Dibromochloromethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Dibromomethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Dichlorodifluoromethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Ethylbenzene	374	10.0		µg/L	10	2/18/2015 5:53:00 PM
Hexachlorobutadiene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Isopropylbenzene	18.0	1.00		µg/L	1	2/18/2015 6:58:00 PM
m,p-Xylene	334	20.0		µg/L	10	2/18/2015 5:53:00 PM
Methyl tert-butyl ether	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Methylene chloride	ND	20.0		µg/L	1	2/18/2015 6:58:00 PM

Specialty Analytical

Date Reported: 20-Feb-15

CLIENT: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08
Lab ID: 1502132-001
Client Sample ID: TOTES-COMP-W

Collection Date: 2/12/2015 4:30:00 PM

Matrix: WATER

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS		SW8260B		Analyst: CK		
Naphthalene	11000	100		µg/L	100	2/18/2015 1:56:00 PM
n-Butylbenzene	1.38	1.00		µg/L	1	2/18/2015 6:58:00 PM
n-Propylbenzene	7.16	1.00		µg/L	1	2/18/2015 6:58:00 PM
o-Xylene	166	10.0		µg/L	10	2/18/2015 5:53:00 PM
sec-Butylbenzene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Styrene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
tert-Butylbenzene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Tetrachloroethene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Toluene	37.3	1.00		µg/L	1	2/18/2015 6:58:00 PM
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Trichloroethene	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Trichlorofluoromethane	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Vinyl chloride	ND	1.00		µg/L	1	2/18/2015 6:58:00 PM
Surr: 1,2-Dichloroethane-d4	101	85.3-116		%REC	1	2/18/2015 6:58:00 PM
Surr: 4-Bromofluorobenzene	97.8	88.1-120		%REC	1	2/18/2015 6:58:00 PM
Surr: Dibromofluoromethane	98.9	94.2-122		%REC	1	2/18/2015 6:58:00 PM
Surr: Toluene-d8	90.4	86.2-135		%REC	1	2/18/2015 6:58:00 PM
CYANIDE, TOTAL		E335.4		Analyst: EFH		
Cyanide	0.131	0.0100		mg/L	1	2/18/2015 8:33:08 AM

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: ICV	SampType: ICV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:				RunNo: 18928			
Client ID: ICV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015				SeqNo: 251085			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.6	0.100	50.00	0	99.1	90	110				
Barium, TCLP	47.9	1.00	50.00	0	95.7	90	110				
Cadmium, TCLP	47.9	0.100	50.00	0	95.8	90	110				
Chromium, TCLP	50.2	0.100	50.00	0	100	90	110				
Lead, TCLP	47.8	0.100	50.00	0	95.6	90	110				
Selenium, TCLP	52.1	1.00	50.00	0	104	90	110				
Silver, TCLP	47.8	0.100	50.00	0	95.6	90	110				

Sample ID: CCV	SampType: CCV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:				RunNo: 18928			
Client ID: CCV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015				SeqNo: 251087			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	48.7	0.100	50.00	0	97.5	90	110				
Barium, TCLP	48.9	1.00	50.00	0	97.8	90	110				
Cadmium, TCLP	50.0	0.100	50.00	0	100	90	110				
Chromium, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Lead, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Selenium, TCLP	47.5	1.00	50.00	0	95.0	90	110				
Silver, TCLP	50.1	0.100	50.00	0	100	90	110				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: MB-8938	SampType: MBLK	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: PBW	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015	SeqNo: 251089						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	ND	0.100									
Barium, TCLP	ND	1.00									
Cadmium, TCLP	ND	0.100									
Chromium, TCLP	ND	0.100									
Lead, TCLP	ND	0.100									
Selenium, TCLP	ND	1.00									
Silver, TCLP	ND	0.100									

Sample ID: LCS-8938	SampType: LCS	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: LCSW	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015	SeqNo: 251090						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	45.8	0.100	50.00	0	91.6	80	120				
Barium, TCLP	50.5	1.00	50.00	0	101	80	120				
Cadmium, TCLP	50.3	0.100	50.00	0	101	80	120				
Chromium, TCLP	46.5	0.100	50.00	0	93.1	80	120				
Lead, TCLP	50.3	0.100	50.00	0	101	80	120				
Selenium, TCLP	44.5	1.00	50.00	0	88.9	80	120				
Silver, TCLP	51.0	0.100	50.00	0	102	80	120				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: A1502141-001BDUP	SampType: DUP	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: ZZZZZZ	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/18/2015	SeqNo: 251093						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	30.4	0.100						30.72	1.15	20	
Barium, TCLP	23.6	1.00						32.63	32.2	20	R
Cadmium, TCLP	ND	0.100						0	0	20	
Chromium, TCLP	ND	0.100						0.1058	200	20	RF
Lead, TCLP	0.115	0.100						0.1273	10.4	20	
Selenium, TCLP	ND	1.00						0	0	20	
Silver, TCLP	ND	0.100						0	0	20	

Sample ID: ICV	SampType: ICV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:				RunNo: 18928			
Client ID: ICV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015				SeqNo: 251363			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.1	0.100	50.00	0	98.1	90	110				
Barium, TCLP	48.5	1.00	50.00	0	97.1	90	110				
Cadmium, TCLP	48.5	0.100	50.00	0	97.0	90	110				
Chromium, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Lead, TCLP	47.5	0.100	50.00	0	95.0	90	110				
Selenium, TCLP	49.1	1.00	50.00	0	98.2	90	110				
Silver, TCLP	47.0	0.100	50.00	0	94.0	90	110				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: A1502141-001BMS	SampType: MS	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: ZZZZZZ	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015	SeqNo: 251368						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	78.2	0.100	50.00	30.72	94.9	70	130				
Barium, TCLP	70.7	1.00	50.00	32.63	76.2	70	130				
Cadmium, TCLP	48.7	0.100	50.00	0.01392	97.4	70	130				
Chromium, TCLP	44.7	0.100	50.00	0.1058	89.2	70	130				
Lead, TCLP	48.8	0.100	50.00	0.1273	97.3	70	130				
Selenium, TCLP	44.4	1.00	50.00	0	88.8	70	130				
Silver, TCLP	47.3	0.100	50.00	0	94.7	70	130				

Sample ID: A1502141-001BMSD	SampType: MSD	TestCode: 6020_TCLP	Units: µg/L	Prep Date: 2/17/2015	RunNo: 18928						
Client ID: ZZZZZZ	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015	SeqNo: 251369						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	76.7	0.100	50.00	30.72	92.0	70	130	78.16	1.86	20	
Barium, TCLP	68.5	1.00	50.00	32.63	71.8	70	130	70.72	3.17	20	
Cadmium, TCLP	48.1	0.100	50.00	0.01392	96.3	70	130	48.71	1.18	20	
Chromium, TCLP	43.4	0.100	50.00	0.1058	86.6	70	130	44.73	3.02	20	
Lead, TCLP	47.2	0.100	50.00	0.1273	94.1	70	130	48.78	3.33	20	
Selenium, TCLP	44.4	1.00	50.00	0	88.8	70	130	44.38	0.0225	20	
Silver, TCLP	46.6	0.100	50.00	0	93.2	70	130	47.33	1.58	20	

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 6020_TCLP

Sample ID: CCV	SampType: CCV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:				RunNo: 18928			
Client ID: CCV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015				SeqNo: 251373			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	48.4	0.100	50.00	0	96.7	90	110				
Barium, TCLP	49.5	1.00	50.00	0	99.1	90	110				
Cadmium, TCLP	49.4	0.100	50.00	0	98.7	90	110				
Chromium, TCLP	46.9	0.100	50.00	0	93.9	90	110				
Lead, TCLP	48.7	0.100	50.00	0	97.4	90	110				
Selenium, TCLP	47.7	1.00	50.00	0	95.4	90	110				
Silver, TCLP	47.9	0.100	50.00	0	95.8	90	110				

Sample ID: CCV	SampType: CCV	TestCode: 6020_TCLP	Units: µg/L	Prep Date:				RunNo: 18928			
Client ID: CCV	Batch ID: 8938	TestNo: E1311/6020	SW3010A	Analysis Date: 2/19/2015				SeqNo: 251384			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.1	0.100	50.00	0	98.2	90	110				
Barium, TCLP	49.8	1.00	50.00	0	99.6	90	110				
Cadmium, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Chromium, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Lead, TCLP	48.6	0.100	50.00	0	97.2	90	110				
Selenium, TCLP	49.6	1.00	50.00	0	99.1	90	110				
Silver, TCLP	48.2	0.100	50.00	0	96.4	90	110				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_W

Sample ID: CCV MSVWS-2015	SampType: CCV	TestCode: 8260_W	Units: µg/L	Prep Date:	RunNo: 18932						
Client ID: CCV	Batch ID: R18932	TestNo: SW8260B		Analysis Date: 2/18/2015	SeqNo: 251211						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	34.3	1.00	40.00	0	85.9	80	120				
1,2-Dichloropropane	38.4	1.00	40.00	0	96.1	80	120				
Chloroform	35.2	1.00	40.00	0	88.1	80	120				
Ethylbenzene	39.6	1.00	40.00	0	99.1	80	120				
Toluene	39.5	1.00	40.00	0	98.8	80	120				
Vinyl chloride	38.1	1.00	40.00	0	95.3	80	120				

Sample ID: LCS MSVWS-2016	SampType: LCS	TestCode: 8260_W	Units: µg/L	Prep Date:	RunNo: 18932						
Client ID: LCSW	Batch ID: R18932	TestNo: SW8260B		Analysis Date: 2/18/2015	SeqNo: 251212						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	42.1	1.00	40.00	0	105	61.2	135				
Benzene	46.2	0.300	40.00	0	116	76.8	125				
Chlorobenzene	46.8	1.00	40.00	0	117	84.1	126				
Toluene	46.6	1.00	40.00	0	116	82	122				
Trichloroethene	41.5	1.00	40.00	0	104	68.5	124				

Sample ID: 1502132-001EMS	SampType: MS	TestCode: 8260_W	Units: µg/L	Prep Date:	RunNo: 18932						
Client ID: TOTES-COMP-W	Batch ID: R18932	TestNo: SW8260B		Analysis Date: 2/18/2015	SeqNo: 251213						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	3670	100	4000	0	91.8	47.8	165				
Benzene	4650	30.0	4000	345.0	108	74.1	136				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_W

Sample ID: 1502132-001EMS	SampType: MS	TestCode: 8260_W	Units: µg/L	Prep Date:	RunNo: 18932						
Client ID: TOTES-COMP-W	Batch ID: R18932	TestNo: SW8260B		Analysis Date: 2/18/2015	SeqNo: 251213						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	4480	100	4000	0	112	70.7	133				
Toluene	4530	100	4000	75.00	111	68.4	135				
Trichloroethene	4210	100	4000	0	105	50.8	164				

Sample ID: 1502132-001EMSD	SampType: MSD	TestCode: 8260_W	Units: µg/L	Prep Date:					RunNo: 18932		
Client ID: TOTES-COMP-W	Batch ID: R18932	TestNo: SW8260B	Analysis Date: 2/18/2015					SeqNo: 251214			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	4330	100	4000	0	108	47.8	165	3670	16.4	20	
Benzene	4990	30.0	4000	345.0	116	74.1	136	4652	6.95	20	
Chlorobenzene	4720	100	4000	0	118	70.7	133	4478	5.22	20	
Toluene	4690	100	4000	75.00	115	68.4	135	4531	3.38	20	
Trichloroethene	4170	100	4000	0	104	50.8	164	4207	0.883	20	

Sample ID: MB	SampType: MBLK	TestCode: 8260_W	Units: µg/L	Prep Date:	RunNo: 18932						
Client ID: PBW	Batch ID: R18932	TestNo: SW8260B		Analysis Date: 2/18/2015	SeqNo: 251215						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1.00									
1,1,1-Trichloroethane	ND	1.00									
1,1,2,2-Tetrachloroethane	ND	1.00									
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.00									
1,1,2-Trichloroethane	ND	1.00									

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_W

Sample ID: MB	SampType: MBLK	TestCode: 8260_W	Units: µg/L	Prep Date:	RunNo: 18932						
Client ID: PBW	Batch ID: R18932	TestNo: SW8260B	Analysis Date: 2/18/2015	SeqNo: 251215							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethane	ND	1.00									
1,1-Dichloroethene	ND	1.00									
1,1-Dichloropropene	ND	1.00									
1,2,3-Trichlorobenzene	ND	1.00									
1,2,3-Trichloropropane	ND	1.00									
1,2,4-Trichlorobenzene	ND	1.00									
1,2,4-Trimethylbenzene	ND	1.00									
1,2-Dibromo-3-chloropropane	ND	1.00									
1,2-Dibromoethane	ND	1.00									
1,2-Dichlorobenzene	ND	1.00									
1,2-Dichloroethane	ND	1.00									
1,2-Dichloropropane	ND	1.00									
1,3,5-Trimethylbenzene	ND	1.00									
1,3-Dichlorobenzene	ND	1.00									
1,3-Dichloropropane	ND	1.00									
1,4-Dichlorobenzene	ND	1.00									
2,2-Dichloropropane	ND	1.00									
2-Butanone	ND	10.0									
2-Chlorotoluene	ND	1.00									
2-Hexanone	ND	10.0									
4-Chlorotoluene	ND	1.00									
4-Isopropyltoluene	ND	1.00									
4-Methyl-2-pentanone	ND	20.0									
Acetone	ND	50.0									
Acrylonitrile	ND	5.00									
Benzene	ND	0.300									

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit	Page 8 of 24
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery	

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_W

Sample ID: MB	SampType: MBLK	TestCode: 8260_W	Units: µg/L	Prep Date:	RunNo: 18932						
Client ID: PBW	Batch ID: R18932	TestNo: SW8260B		Analysis Date: 2/18/2015	SeqNo: 251215						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromobenzene	ND	1.00									
Bromochloromethane	ND	1.00									
Bromodichloromethane	ND	1.00									
Bromoform	ND	1.00									
Bromomethane	ND	1.00									
Carbon disulfide	ND	2.00									
Carbon tetrachloride	ND	1.00									
Chlorobenzene	ND	1.00									
Chloroethane	ND	1.00									
Chloroform	ND	1.00									
Chloromethane	ND	1.00									
cis-1,2-Dichloroethene	ND	1.00									
cis-1,3-Dichloropropene	ND	1.00									
Dibromochloromethane	ND	1.00									
Dibromomethane	ND	1.00									
Dichlorodifluoromethane	ND	1.00									
Ethylbenzene	ND	1.00									
Hexachlorobutadiene	ND	1.00									
Isopropylbenzene	ND	1.00									
m,p-Xylene	ND	2.00									
Methyl tert-butyl ether	ND	1.00									
Methylene chloride	ND	20.0									
Naphthalene	ND	1.00									
n-Butylbenzene	ND	1.00									
n-Propylbenzene	ND	1.00									
o-Xylene	ND	1.00									

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8260_W

Sample ID: MB	SampType: MBLK	TestCode: 8260_W	Units: µg/L	Prep Date:	RunNo: 18932						
Client ID: PBW	Batch ID: R18932	TestNo: SW8260B		Analysis Date: 2/18/2015	SeqNo: 251215						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
sec-Butylbenzene	ND	1.00									
Styrene	ND	1.00									
tert-Butylbenzene	ND	1.00									
Tetrachloroethene	ND	1.00									
Toluene	ND	1.00									
trans-1,2-Dichloroethene	ND	1.00									
trans-1,3-Dichloropropene	ND	1.00									
Trichloroethene	ND	1.00									
Trichlorofluoromethane	ND	1.00									
Vinyl chloride	ND	1.00									
Surr: 1,2-Dichloroethane-d4	104		100.0		104	85.3	116				
Surr: 4-Bromofluorobenzene	93.3		100.0		93.3	88.1	120				
Surr: Dibromofluoromethane	100		100.0		100	94.2	122				
Surr: Toluene-d8	101		100.0		101	86.2	135				

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL_W

Sample ID: CCV-8934	SampType: CCV	TestCode: 8270LL_W	Units: µg/L	Prep Date:				RunNo: 18904			
Client ID: CCV	Batch ID: 8934	TestNo: SW8270D	SW 3510C	Analysis Date: 2/17/2015				SeqNo: 250505			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	40.2	1.00	40.00	0	101	80	120				
1,2-Diphenylhydrazine	42.4	5.00	40.00	0	106	80	120				
1,4-Dichlorobenzene	36.8	1.00	40.00	0	92.0	80	120				
2,3,5,6-Tetrachlorophenol	42.4	5.00	40.00	0	106	80	120				
2,4,6-Trichlorophenol	43.8	5.00	40.00	0	110	80	120				
2,4-Dichlorophenol	42.6	3.00	40.00	0	107	80	120				
2-Nitrophenol	44.0	5.00	40.00	0	110	80	120				
4-Chloro-3-methylphenol	45.6	2.00	40.00	0	114	80	120				
Acenaphthene	45.9	1.00	40.00	0	115	80	120				
Benzo(a)pyrene	47.6	1.00	40.00	0	119	80	120				
Di-n-octyl phthalate	46.9	1.00	40.00	0	117	80	120				
Fluoranthene	44.8	1.00	40.00	0	112	80	120				
Hexachlorobutadiene	41.3	2.00	40.00	0	103	80	120				
N-Nitrosodiphenylamine	42.8	1.00	40.00	0	107	80	120				
Pentachlorophenol	34.9	5.00	40.00	0	87.3	80	120				
Phenol	47.2	2.00	40.00	0	118	80	120				

Sample ID: LCS-8934	SampType: LCS	TestCode: 8270LL_W	Units: µg/L	Prep Date: 2/16/2015	RunNo: 18904						
Client ID: LCSW	Batch ID: 8934	TestNo: SW8270D	SW 3510C	Analysis Date: 2/17/2015	SeqNo: 250506						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	30.1	1.00	50.00	0	60.3	42.4	104				
1,4-Dichlorobenzene	31.3	1.00	50.00	0	62.6	37.9	105				
2,4-Dinitrotoluene	38.4	5.00	50.00	0	76.9	52.9	133				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL_W

Sample ID: LCS-8934	SampType: LCS	TestCode: 8270LL_W	Units: µg/L	Prep Date: 2/16/2015	RunNo: 18904						
Client ID: LCSW	Batch ID: 8934	TestNo: SW8270D	SW 3510C	Analysis Date: 2/17/2015	SeqNo: 250506						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Chlorophenol	44.7	1.00	50.00	0	89.4	27.8	118				
4-Chloro-3-methylphenol	48.3	2.00	50.00	0	96.6	33.5	129				
4-Nitrophenol	16.0	5.00	50.00	0	32.0	11.4	49.1				
Acenaphthene	42.1	1.00	50.00	0	84.3	42.4	124				
N-Nitrosodi-n-propylamine	61.9	2.00	50.00	0	124	33.9	138				
Pentachlorophenol	22.3	5.00	50.00	0	44.5	43.3	113				
Phenol	16.7	2.00	50.00	0	33.4	6.73	54.7				
Pyrene	40.3	1.00	50.00	0	80.7	59.4	119				

Sample ID: LCSD-8934	SampType: LCSD	TestCode: 8270LL_W	Units: µg/L	Prep Date: 2/16/2015	RunNo: 18904						
Client ID: LCSS02	Batch ID: 8934	TestNo: SW8270D	SW 3510C	Analysis Date: 2/17/2015	SeqNo: 250507						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	28.2	1.00	50.00	0	56.5	42.4	104	30.14	6.47	20	
1,4-Dichlorobenzene	28.1	1.00	50.00	0	56.3	37.9	105	31.32	10.7	20	
2,4-Dinitrotoluene	38.8	5.00	50.00	0	77.7	52.9	133	38.45	1.01	20	
2-Chlorophenol	40.4	1.00	50.00	0	80.7	27.8	118	44.69	10.2	20	
4-Chloro-3-methylphenol	48.5	2.00	50.00	0	97.1	33.5	129	48.28	0.516	20	
4-Nitrophenol	22.4	5.00	50.00	0	44.7	11.4	49.1	16.02	33.1	20	R
Acenaphthene	40.2	1.00	50.00	0	80.4	42.4	124	42.14	4.76	20	
N-Nitrosodi-n-propylamine	58.0	2.00	50.00	0	116	33.9	138	61.87	6.51	20	
Pentachlorophenol	25.4	5.00	50.00	0	50.9	43.3	113	22.27	13.2	20	
Phenol	17.6	2.00	50.00	0	35.1	6.73	54.7	16.71	4.90	20	
Pyrene	38.9	1.00	50.00	0	77.9	59.4	119	40.33	3.53	20	

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 12 of 24
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL_W

Sample ID: LCSD-8934	SampType: LCSD	TestCode: 8270LL_W	Units: µg/L	Prep Date: 2/16/2015	RunNo: 18904						
Client ID: LCSS02	Batch ID: 8934	TestNo: SW8270D	SW 3510C	Analysis Date: 2/17/2015	SeqNo: 250507						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: MB-8934	SampType: MBLK	TestCode: 8270LL_W	Units: µg/L	Prep Date: 2/16/2015	RunNo: 18904						
Client ID: PBW	Batch ID: 8934	TestNo: SW8270D	SW 3510C	Analysis Date: 2/17/2015	SeqNo: 250508						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,2,4-Trichlorobenzene	ND	1.00
1,2-Dichlorobenzene	ND	1.00
1,2-Diphenylhydrazine	ND	5.00
1,3-Dichlorobenzene	ND	1.00
1,4-Dichlorobenzene	ND	1.00
1-Methylnaphthalene	ND	1.00
2,3,4-Trichlorophenol	ND	1.00
2,3,5,6-Tetrachlorophenol	ND	5.00
2,3,5-Trichlorophenol	ND	1.00
2,3,6-Trichlorophenol	ND	1.00
2,4,5-Trichlorophenol	ND	5.00
2,4,6-Trichlorophenol	ND	5.00
2,4-Dichlorophenol	ND	3.00
2,4-Dimethylphenol	ND	1.00
2,4-Dinitrophenol	ND	10.0
2,4-Dinitrotoluene	ND	5.00
2,6-Dinitrotoluene	ND	5.00
2-Chloronaphthalene	ND	1.00
2-Chlorophenol	ND	1.00

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL_W

Sample ID: MB-8934	SampType: MBLK	TestCode: 8270LL_W	Units: µg/L	Prep Date: 2/16/2015	RunNo: 18904						
Client ID: PBW	Batch ID: 8934	TestNo: SW8270D	SW 3510C	Analysis Date: 2/17/2015	SeqNo: 250508						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Methylnaphthalene	ND	1.00									
2-Methylphenol	ND	2.00									
2-Nitroaniline	ND	5.00									
2-Nitrophenol	ND	5.00									
3-&4-Methylphenol	ND	10.0									
3,3´-Dichlorobenzidine	ND	5.00									
3-Nitroaniline	ND	6.00									
4,6-Dinitro-2-methylphenol	ND	10.0									
4-Bromophenyl phenyl ether	ND	1.00									
4-Chloro-3-methylphenol	ND	2.00									
4-Chloroaniline	ND	3.00									
4-Chlorophenyl phenyl ether	ND	1.00									
4-Nitroaniline	ND	5.00									
4-Nitrophenol	ND	5.00									
Acenaphthene	ND	1.00									
Acenaphthylene	ND	1.00									
Anthracene	ND	1.00									
Benz(a)anthracene	ND	1.00									
Benzo(a)pyrene	ND	1.00									
Benzo(b)fluoranthene	ND	1.00									
Benzo(g,h,i)perylene	ND	1.00									
Benzo(k)fluoranthene	ND	1.00									
Benzoic Acid	ND	20.0									
Benzyl Alcohol	ND	5.00									
Bis(2-chloroethoxy)methane	ND	1.00									
Bis(2-chloroethyl)ether	ND	2.00									

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit	Page 14 of 24
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery	

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL_W

Sample ID: MB-8934	SampType: MBLK	TestCode: 8270LL_W	Units: µg/L	Prep Date: 2/16/2015	RunNo: 18904						
Client ID: PBW	Batch ID: 8934	TestNo: SW8270D	SW 3510C	Analysis Date: 2/17/2015	SeqNo: 250508						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bis(2-chloroisopropyl)ether	ND	1.00									
Bis(2-ethylhexyl)phthalate	ND	1.00									
Butyl benzyl phthalate	ND	1.00									
Carbazole	ND	1.00									
Chrysene	ND	1.00									
Dibenz(a,h)anthracene	ND	1.00									
Dibenzofuran	ND	1.00									
Diethyl phthalate	ND	1.00									
Dimethyl phthalate	ND	1.00									
Di-n-butyl phthalate	ND	1.00									
Di-n-octyl phthalate	ND	1.00									
Fluoranthene	ND	1.00									
Fluorene	ND	1.00									
Hexachlorobenzene	ND	1.00									
Hexachlorobutadiene	ND	2.00									
Hexachlorocyclopentadiene	ND	5.00									
Hexachloroethane	ND	2.00									
Indeno(1,2,3-cd)pyrene	ND	1.00									
Isophorone	ND	1.00									
Naphthalene	ND	1.00									
Nitrobenzene	ND	1.00									
N-Nitrosodimethylamine	ND	1.00									
N-Nitrosodi-n-propylamine	ND	2.00									
N-Nitrosodiphenylamine	ND	1.00									
Pentachlorophenol	ND	5.00									
Phenanthrene	ND	1.00									

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit	Page 15 of 24
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery	

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL_W

Sample ID: MB-8934	SampType: MBLK	TestCode: 8270LL_W	Units: µg/L	Prep Date: 2/16/2015	RunNo: 18904						
Client ID: PBW	Batch ID: 8934	TestNo: SW8270D	SW 3510C	Analysis Date: 2/17/2015	SeqNo: 250508						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	ND	2.00									
Pyrene	ND	1.00									
Pyridine	ND	5.00									
Surr: 2,4,6-Tribromophenol	48.2		100.0		48.2	33.1	99.7				
Surr: 2-Fluorobiphenyl	38.5		100.0		38.5	33.1	96.2				
Surr: 2-Fluorophenol	27.1		100.0		27.1	13.4	57.1				
Surr: 4-Terphenyl-d14	47.6		100.0		47.6	41	122				
Surr: Nitrobenzene-d5	56.8		100.0		56.8	28.9	99.9				
Surr: Phenol-d6	15.6		100.0		15.6	10.6	38.5				

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: CN_W

Sample ID: R18933ICV		SampType: ICV		TestCode: CN_W		Units: mg/L		Prep Date:			RunNo: 18933		
Client ID: ICV		Batch ID: R18933		TestNo: E335.4		Analysis Date: 2/17/2015			SeqNo: 251060				
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide 0.323 0.0100 0.3000 0 108 90 110

Sample ID: R18933ICV	SampType: ICV	TestCode: CN_W	Units: mg/L	Prep Date:	RunNo: 18933						
Client ID: ICV	Batch ID: R18933	TestNo: E335.4		Analysis Date: 2/18/2015	SeqNo: 251063						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide 0.313 0.0100 0.3000 0 104 90 110

Sample ID: MB-R18933	SampType: MBLK	TestCode: CN_W	Units: mg/L	Prep Date:					RunNo: 18933		
Client ID: PBW	Batch ID: R18933	TestNo: E335.4	Analysis Date: 2/18/2015					SeqNo: 251064			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide ND 0.0100

Sample ID: LCS-R18933	SampType: LCS	TestCode: CN_W	Units: mg/L	Prep Date:	RunNo: 18933						
Client ID: LCSW	Batch ID: R18933	TestNo: E335.4		Analysis Date: 2/18/2015	SeqNo: 251065						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide 0.220 0.0100 0.2000 0 110 80 120

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 17 of 24
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: CN_W

Sample ID: 1502119-001BMS	SampType: MS	TestCode: CN_W	Units: mg/L	Prep Date:	RunNo: 18933						
Client ID: ZZZZZZ	Batch ID: R18933	TestNo: E335.4		Analysis Date: 2/18/2015	SeqNo: 251067						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide	0.151	0.0100	0.1000	0.03410	117	67.9	120				
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Sample ID: 1502119-001BMSD	SampType: MSD	TestCode: CN_W	Units: mg/L	Prep Date:	RunNo: 18933						
Client ID: ZZZZZZ	Batch ID: R18933	TestNo: E335.4		Analysis Date: 2/18/2015	SeqNo: 251068						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide	0.147	0.0100	0.1000	0.03410	113	67.9	120	0.1509	2.35	20	
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Sample ID: R18933CCV		SampType: CCV		TestCode: CN_W		Units: mg/L		Prep Date:			RunNo: 18933		
Client ID: CCV		Batch ID: R18933		TestNo: E335.4		Analysis Date: 2/18/2015			SeqNo: 251074				
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cyanide	0.363	0.0100	0.3500	0	104	90	110				
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Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: HG_CT

Sample ID: MB-8944	SampType: MBLK	TestCode: HG_CT	Units: mg/L	Prep Date: 2/17/2015	RunNo: 18910						
Client ID: PBW	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250577						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury, TCLP ND 0.000100

Sample ID: LCS-8944	SampType: LCS	TestCode: HG_CT	Units: mg/L	Prep Date: 2/17/2015	RunNo: 18910						
Client ID: LCSW	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250578						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury, TCLP 0.00379 0.000100 0.004000 0 94.7 85.4 116

Sample ID: 1502126-002BMS	SampType: MS	TestCode: HG_CT	Units: mg/L	Prep Date: 2/17/2015	RunNo: 18910						
Client ID: ZZZZZZ	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250584						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury, TCLP 0.00407 0.000100 0.004000 0 102 69.5 125

Sample ID: 1502126-002BMSD	SampType: MSD	TestCode: HG_CT	Units: mg/L	Prep Date: 2/17/2015	RunNo: 18910						
Client ID: ZZZZZZ	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250585						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury, TCLP 0.00382 0.000100 0.004000 0 95.5 69.5 125 0.004069 6.31 20

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 19 of 24
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: HG_CT

Sample ID: CCV	SampType: CCV	TestCode: HG_CT	Units: mg/L	Prep Date:	RunNo: 18910						
Client ID: CCV	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: 2/17/2015	SeqNo: 250588						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury, TCLP	0.00371	0.000100	0.004000	0	92.8	90	110				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: NWTPHDXLL_W

Sample ID: CCV	SampType: CCV	TestCode: NWTPHDXLL	Units: mg/L	Prep Date:	RunNo: 18901						
Client ID: CCV	Batch ID: 8933	TestNo: NWTPH-Dx	SW3510B	Analysis Date: 2/16/2015	SeqNo: 250464						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	6.40	0.0800	6.000	0	107	85	115				
Lube Oil	3.05	0.200	3.000	0	102	85	115				

Sample ID: MB-8933	SampType: MBLK	TestCode: NWTPHDXLL	Units: mg/L	Prep Date: 2/16/2015	RunNo: 18901						
Client ID: PBW	Batch ID: 8933	TestNo: NWTPH-Dx	SW3510B	Analysis Date: 2/16/2015	SeqNo: 250465						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	0.0800									
Lube Oil	ND	0.200									
Surr: o-Terphenyl	0.190		0.2000		94.8	50	150				

Sample ID: LCS-8933	SampType: LCS	TestCode: NWTPHDXLL	Units: mg/L	Prep Date: 2/16/2015	RunNo: 18901						
Client ID: LCSW	Batch ID: 8933	TestNo: NWTPH-Dx	SW3510B	Analysis Date: 2/16/2015	SeqNo: 250466						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	0.743	0.0800	1.000	0	74.3	60.7	121				
Lube Oil	0.788	0.200	1.000	0	78.8	64	126				

Sample ID: LCSD-8933	SampType: LCSD	TestCode: NWTPHDXLL	Units: mg/L	Prep Date: 2/16/2015	RunNo: 18901						
Client ID: LCSS02	Batch ID: 8933	TestNo: NWTPH-Dx	SW3510B	Analysis Date: 2/16/2015	SeqNo: 250467						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: B Analyte detected in the associated Method Blank H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit Page 21 of 24
O RSD is greater than RSDlimit R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: NWTPHDXLL_W

Sample ID: LCSD-8933	SampType: LCSD	TestCode: NWTPHDXLL	Units: mg/L	Prep Date: 2/16/2015	RunNo: 18901						
Client ID: LCSS02	Batch ID: 8933	TestNo: NWTPH-Dx	SW3510B	Analysis Date: 2/16/2015	SeqNo: 250467						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	0.737	0.0800	1.000	0	73.7	60.7	121	0.7431	0.862	20	
Lube Oil	0.757	0.200	1.000	0	75.7	64	126	0.7880	4.00	20	

Sample ID: CCV	SampType: CCV	TestCode: NWTPHDXLL	Units: mg/L	Prep Date:	RunNo: 18901						
Client ID: CCV	Batch ID: 8933	TestNo: NWTPH-Dx	SW3510B	Analysis Date: 2/16/2015	SeqNo: 250469						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	8.40	0.0800	8.000	0	105	85	115				
Lube Oil	4.39	0.200	4.000	0	110	85	115				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: NWTPHGX_W

Sample ID: CCV	SampType: CCV	TestCode: NWTPHGX_W	Units: µg/L	Prep Date:	RunNo: 18951						
Client ID: CCV	Batch ID: R18951	TestNo: NWTPH-Gx	Analysis Date: 2/19/2015	SeqNo: 251422							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	2010	100	2000	0	100	80	120				
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Sample ID: MB-R18951	SampType: MBLK	TestCode: NWTPHGX_W	Units: µg/L	Prep Date:	RunNo: 18951						
Client ID: PBW	Batch ID: R18951	TestNo: NWTPH-Gx	Analysis Date: 2/19/2015	SeqNo: 251423							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	100									
Surr: 4-Bromofluorobenzene	110		100.0		110	50	150				

Sample ID: CCV	SampType: CCV	TestCode: NWTPHGX_W	Units: µg/L	Prep Date:	RunNo: 18951						
Client ID: CCV	Batch ID: R18951	TestNo: NWTPH-Gx	Analysis Date: 2/19/2015	SeqNo: 251432							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	1990	100	2000	0	99.7	80	120				
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Sample ID: CCB	SampType: CCB	TestCode: NWTPHGX_W	Units: µg/L	Prep Date:	RunNo: 18951						
Client ID: CCB	Batch ID: R18951	TestNo: NWTPH-Gx	Analysis Date: 2/19/2015	SeqNo: 251433							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	100									
Surr: 4-Bromofluorobenzene	103		100.0		103	50	150				

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit	Page 23 of 24
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery	

QC SUMMARY REPORT

WO#: 1502132

20-Feb-15

Specialty Analytical

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: NWTPHGX_W

Sample ID: 1502140-004ADUP	SampType: DUP	TestCode: NWTPHGX_W Units: µg/L				Prep Date:			RunNo: 18951		
Client ID: ZZZZZZ	Batch ID: R18951	TestNo: NWTPH-Gx				Analysis Date: 2/19/2015			SeqNo: 251435		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	32100	1000						33380	3.93	20	

Sample ID: CCV	SampType: CCV	TestCode: NWTPHGX_W Units: µg/L				Prep Date:			RunNo: 18951		
Client ID: CCV	Batch ID: R18951	TestNo: NWTPH-Gx				Analysis Date: 2/19/2015			SeqNo: 251436		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	2730	100	2500	0	109	80	120				

Qualifiers: B Analyte detected in the associated Method Blank
O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery

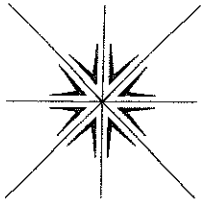
KEY TO FLAGS

Rev. May 12, 2010

- A This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
- A1 This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
- A2 This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
- A3 The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
- A4 The product appears to be aged or degraded diesel.
- B The blank exhibited a positive result great than the reporting limit for this compound.
- CN See Case Narrative.
- D Result is based from a dilution.
- E Result exceeds the calibration range for this compound. The result should be considered as estimate.
- F The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
- G Result may be biased high due to biogenic interferences. Clean up is recommended.
- H Sample was analyzed outside recommended holding time.
- HT At clients request, samples was analyzed outside of recommended holding time.
- J The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
- K Diesel result is biased high due to amount of Oil contained in the sample.
- L Diesel result is biased high due to amount of Gasoline contained in the sample.
- M Oil result is biased high due to amount of Diesel contained in the sample.
- MC Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
- MI Result is outside control limits due to matrix interference.
- MSA Value determined by Method of Standard Addition.
- O Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
- Q Detection levels elevated due to sample matrix.
- R RPD control limits were exceeded.
- RF Duplicate failed due to result being at or near the method-reporting limit.
- RP Matrix spike values exceed established QC limits; post digestion spike is in control.
- S Recovery is outside control limits.
- SC Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
- * The result for this parameter was greater than the maximum contaminant level of the TCLP regulatory limit.

CHAIN OF CUSTODY RECORD

Page 1 of 1



Specialty Analytical

11711 SE Capps Road
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Contact Person/Project Manager James Peale
Company Mail Foster & Alongi, Inc.
Address 2001 NW 19th Ave, Suite 200
Portland, OR 97209
Phone 971-544-2139 Fax 971-544-2140
Project No. 8128-01-03/08 Project Name Siltronic
Project Site Location OR ☒ WA ☐ Other ☐
Invoice To MFA P.O. No.

Collected By: Kelly R. T. Kemmerer
Signature Kelly R. T. Kemmerer
Printed Kelly R. T. Kemmerer

Signature
Printed

Turn Around Time

☒ Normal 5-7 Business Days

☐ Rush

Specify

Rush Analyses Must Be Scheduled With The Lab In Advance

				Analyses							For Laboratory Use			
				No. of Containers	8260	8270	TECP METALS (RCRA 9)	TPH-DX	TPH-GX	TOTAL CYANIDE			Lab Job No. <u>1002132</u>	
													Shipped Via <u>Specialty</u>	
													Air Bill No. <u></u>	
													Temperature On Receipt <u>4</u> °C	
													Specialty Analytical Containers? Y / N	
													Specialty Analytical Trip Blanks? Y / N	
Date	Time	Sample I.D.	Matrix										Comments	Lab I.D.
<u>2/12/15</u>	<u>1630</u>	<u>TOTES - COMP - W</u>	<u>W</u>	<u>12</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			
<u>2/12/15</u>														
<u>2/12/15</u>		<u>TRIP BLANK</u>	<u>W</u>	<u>2</u>	<u>X</u>									
Relinquished By: <u>Kelly R. T. Kemmerer</u>	Date	Time	Received By: <u>James Peale</u>	Relinquished By: <u>James Peale</u>				Date	Time					
Company: <u>MFA</u>	<u>2/13/15</u>	<u>1128</u>	Company: <u>MFA</u>	Company: <u>MFA</u>				<u>2/13/15</u>	<u>1300</u>					
Unless Reclaimed, Samples Will Be Disposed of 60 Days After Receipt. Samples held beyond 60 days subject to storage fee(s)							Received For Lab By: <u>Cindy Hillgard</u>		Date	Time				
									<u>2/13/15</u>	<u>1300</u>				

ATTACHMENT D

DISPOSAL MANIFESTS





742055

Please print or type (Form designed for use on elite (12-pitch) typewriter.)

Form Approved, OMB No. 2050-0030

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number ORD 0 9 6 2 5 3 7 3 7	2. Page 1 of 2	3. Emergency Response Phone (877) 818-0087	4. Manifest Tracking Number 000966527 VES			
5. Generator's Name and Mailing Address SILTRONIC/PROJECT 7308 NW FRONT AVE MAILBOX 50 ATTN: K LAIL PORTLAND, OR 97210		Generator's Site Address (if different than mailing address) SAME						
Generator's Phone: 503 501-5218								
6. Transporter 1 Company Name VEOLIA ES TECHNICAL SOLUTIONS		U.S. EPA ID Number NJ D 0 8 0 6 3 1 3 6 9						
7. Transporter 2 Company Name SAVANNAH TRANSPORT		U.S. EPA ID Number KS 0 0 0 0 3 3 6 8 9 1						
8. Designated Facility Name and Site Address VEOLIA ES TECHNICAL SOLUTIONS HIGHWAY 73 3.5 MILES W. OF TAYLOR'S BAYOU PORT ARTHUR, TX 77640		U.S. EPA ID Number TX D 0 0 0 8 1 8 8 0 0						
Facility's Phone: 409 736-2821								
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit (Vol/Wt)	13. Waste Codes		
		No.	Type					
	1. NA3081, HAZARDOUS WASTE, LIQUID, n.d.s., (VINYL CHLORIDE, TRICHLOROETHENE), 2, III	5	T P	12500	P	F002	D640	D043
	2.					F037	OUTSIDE	
	3.							
4.								
14. Special Handling Instructions and Additional Information ER Service Contracted by VESTS - 1) ERG:171 W:71087								
15. GENERATOR/SHOFFER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste characterization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.								
Generator's Officer's Printed/Typed Name Koreen Lail		Signature Koreen Lail		Month Day Year 13 14 15				
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S.		Port of export/exit Date leaving U.S.:						
17. Transporter Acknowledgment of Receipt of Materials								
Transporter 1 Printed/Typed Name Christine Brown		Signature Christine Brown		Month Day Year 10 31 15				
Transporter 2 Printed/Typed Name JACK P. TATE		Signature Jack P. Tate		Month Day Year 13 13 15				
18. Discrepancy								
18a. Discrepancy Indication Space		<input type="checkbox"/> Quantity	<input type="checkbox"/> Type	<input type="checkbox"/> Residue	<input type="checkbox"/> Partial Rejection	<input type="checkbox"/> Full Rejection		
Manifest Reference Number:								
18b. Alternate Facility (or Generator)								
Facility's Name:								
18c. Signature of Alternate Facility (or Generator)						Month Day Year		
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, storage, and recycling systems)								
1. HD40		2.		3.		4.		
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in item 18a.								
Printed/Typed Name Alane Thomas		Signature Alane Thomas		Month Day Year 13 19 15				

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Land Disposal Restriction Notification Form

Generator Name SILTRONIC/PROJECT

EPA ID Number ORD0096253737

Manifest 000966527VES

This notice is being provided in accordance with 40 CFR 268.7 to inform you that this shipment contains waste restricted from land disposal by the USEPA under the land disposal restriction program. Identified below for each container is the designation of the waste as a wastewater or non-wastewater, the Clean Water Act (CWA) permit status associated with the treatment/disposal facility, applicable waste codes and any corresponding subcategories, list of any F001-F005 solvent constituents that are present in the waste, and any underlying hazardous constituents (UHC) that are present.

Container Number Q1-218945998-001 (1/ 1)

WLP / Approval Code:	071087 / PTA071087
Form Designation / CWA Status:	Non-Wastewater / Non-CWA
Waste Codes (Subcategories):	D040, D043, F002, F037
Constituents (F001 - F005):	DISPOSAL SITE MONITORS FOR ALL CONSTITUENTS
UHCs Present:	BENZENE, TOLUENE (NON F-LISTED)
Treatment Requirements:	Restricted waste requires treatment to applicable standards.
Additional Notices:	

I hereby certify that all information in this and associated land disposal restriction documents is complete and accurate to the best of my knowledge and information.

Signature

John Seibel for Siltronic

Title

Env. Engineer

Date

3/4/15



742063

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved, OMB No. 2950-0039

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number O E D 0 9 6 2 5 3 7 3 7	2. Page 1 of 2	3. Emergency Response Phone (877) 818-0087	4. Manifest Tracking Number 000966526 VES	
5. Generator's Name and Mailing Address SILTRONIC/PROJECT 7200 NW FRONT AVE MAILBOX 50 ATTN: K LAIL PORTLAND, OR 97210		Generator's Site Address (if different than mailing address) SAME				
Generator's Phone 503 591-5218						
6. Transporter 1 Company Name VEOLIA ES TECHNICAL SOLUTIONS		U.S. EPA ID Number N I E 0 8 0 6 3 1 3 6 9				
7. Transporter 2 Company Name SAVANNAH TRANSPORT		U.S. EPA ID Number K S 0 0 0 0 3 3 6 6 9 1				
8. Designated Facility Name and Site Address VEOLIA ES TECHNICAL SOLUTIONS HIGHWAY 73 2.5 MILES W. OF TAYLOR'S BAYOU PORT ARTHUR, TX 77640		U.S. EPA ID Number T X D 0 0 0 8 3 3 8 9 6				
Facility's Phone: 409 736-2021						
9a. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit (lit./vol)	13. Waste Codes	
	No.	Type				
	1. HAZARDOUS WASTE, LIQUID, n.o.s., (VINYL CHLORIDE, TRICHLOROETHENE), Y, H	5	T P	12500	P	F002 D040 D043 F037 OUTS WH
	2.					
	3.					
14. Special Handling Instructions and Additional Information ER Service Contracted by VESTS +/- 1) ERG:171 W:71087						
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/packaged, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 282.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.						
Generator's/Officer's Printed/Typed Name Koreen Lail		Signature Koreen Lail		Month Day Year 13 14 15		
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S.		Port of entry/exit: Date leaving U.S.:				
17. Transporter Acknowledgment of Receipt of Materials						
Transporter 1 Printed/Typed Name Christine Brown		Signature Christine Brown		Month Day Year 10 31 15		
Transporter 2 Printed/Typed Name Bruce SAVALOTA		Signature Bruce Savalota		Month Day Year 13 19 15		
18. Discrepancy 18a. Discrepancy Indication on Spec <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection						
18b. Alternate Facility (or Generator) Manifest Reference Number U.S. EPA ID Number						
Facility's Phone:						
18c. Signature of Alternate Facility (or Generator) Month Day Year						
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal and recycling systems)						
1. H040		2.		3.		
20. Designated Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 18a						
Printed/Typed Name Alane Thomas		Signature Alane Thomas		Month Day Year 13 19 15		

[illegible]

Land Disposal Restriction Notification Form

Generator Name SILTRONIC/PROJECT

EPA ID Number ORD096253737

Manifest 000966526VES

This notice is being provided in accordance with 40 CFR 268.7 to inform you that this shipment contains waste restricted from land disposal by the USEPA under the land disposal restriction program. Identified below for each container is the designation of the waste as a wastewater or non-wastewater, the Clean Water Act (CWA) permit status associated with the treatment/disposal facility, applicable waste codes and any corresponding subcategories, list of any F001-F005 solvent constituents that are present in the waste, and any underlying hazardous constituents (UHC) that are present.

Container Number: Q1-2185459999-001 (1/ 1)

WIP / Approval Code:	071087 / PTA071087
Form Designation / CWA Status:	Non-Wastewater / Non-CWA
Waste Codes (Subcategories):	D040, D043, F002, F037
Constituents (F001 - F005):	DISPOSAL SITE MONITORS FOR ALL CONSTITUENTS
UHCs Present:	BENZENE, TOLUENE (NON F-LISTED)
Treatment Requirements:	Restricted waste requires treatment to applicable standards.
Additional Notices:	

I hereby certify that all information in this and associated land disposal restriction documents is complete and accurate to the best of my knowledge and information.

Signature

[Handwritten Signature]

Title

Env. Engineer

Date

3/4/15

741579

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number ORD096253737	2. Page 1 of 2	3. Emergency Response Phone (877) 818-0067	4. Manifest Tracking Number 000966525 VES			
5. Generator's Name and Mailing Address SILTRONIC/PROJECT 7200 NW FRONT AVE MAILBOX 50 ATTN: K LAIL PORTLAND, OR 97210			Generator's Site Address (if different than mailing address) SAME					
Generator's Phone: 503 501-5218			U.S. EPA ID Number NJD080631369					
6. Transporter 1 Company Name VEOLIA ES TECHNICAL SOLUTIONS			U.S. EPA ID Number KS0000336891					
7. Transporter 2 Company Name SAVANNAH TRANSPORT			U.S. EPA ID Number TXD000838896					
8. Designated Facility Name and Site Address VEOLIA ES TECHNICAL SOLUTIONS HIGHWAY 73 3.5 MILES W. OF TAYLOR'S BAYOU PORT ARTHUR, TX 77640			Facility's Phone: 409 736-2821					
9a. HM X	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any)) 1. NA3077, HAZARDOUS WASTE, SOLID, n.o.s. (TRICHLOROETHYLENE, BENZENE), 9, III, RQ (F002)		10. Containers No. 2 Type DM		11. Total Quantity 1398	12. Unit Wt./Vol. P	13. Waste Codes F002 F037 OUTS01H	
	2.							
	3.							
	4.							
14. Special Handling Instructions and Additional Information ER Service Contracted by VESTS -1) ERG:171 W:541996								
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.								
Generator's/Offor's Printed/Typed Name Karen Lail		Signature <i>Karen Lail</i>				Month Day Year 13 4 15		
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S.		Port of entry/exit: Date leaving U.S.:						
17. Transporter Acknowledgment of Receipt of Materials								
Transporter 1 Printed/Typed Name Christine Brown		Signature <i>Christine Brown</i>				Month Day Year 10 04 15		
Transporter 2 Printed/Typed Name Myron Emmons		Signature <i>Myron Emmons</i>				Month Day Year 3 6 15		
18. Discrepancy								
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection								
Manifest Reference Number:								
18b. Alternate Facility (or Generator) U.S. EPA ID Number								
Facility's Phone:								
18c. Signature of Alternate Facility (or Generator) Month Day Year								
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)								
1. H040		2.		3.		4.		
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a								
Printed/Typed Name Alane Thomas		Signature <i>Alane Thomas</i>				Month Day Year 3 12 15		

[illegible]

Land Disposal Restriction Notification Form

Generator Name SILTRONIC/PROJECT

EPA ID Number ORD096253737

Manifest 000966525VES

This notice is being provided in accordance with 40 CFR 268.7 to inform you that this shipment contains waste restricted from land disposal by the USEPA under the land disposal restriction program. Identified below for each container is the designation of the waste as a wastewater or non-wastewater, the Clean Water Act (CWA) permit status associated with the treatment/disposal facility, applicable waste codes and any corresponding subcategories, list of any F001-F005 solvent constituents that are present in the waste, and any underlying hazardous constituents (UHC) that are present.

Container Number Q1-2189459002-001 (1/ 1)

WTP / Approval Code:	541996 / HENPTA964358
Form Designation / CWA Status:	Non-Wastewater / Non-CWA
Waste Codes (Subcategories):	F002, F037
Constituents (F001 - F005):	DISPOSAL SITE MONITORS FOR ALL CONSTITUENTS
UHCs Present:	Not Applicable
Treatment Requirements:	Restricted waste requires treatment to applicable standards.
Additional Notices:	

I hereby certify that all information in this and associated land disposal restriction documents is complete and accurate to the best of my knowledge and information.

Signature

Donna L. de la Sota

Title

Proc Engineer

Date

3/4/15



741580

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number ORD 096253737	2. Page 1 of 2	3. Emergency Response Phone (877) 818-0087	4. Manifest Tracking Number 000966524 VES			
5. Generator's Name and Mailing Address SILTRONIC/PROJECT 7200 NW FRONT AVE MAILBOX 50 ATTN: K LAIL PORTLAND, OR 97310			Generator's Site Address (if different than mailing address) SAME					
Generator's Phone: 503 501-5218			U.S. EPA ID Number NJ D 0 8 0 6 3 1 3 6 9					
6. Transporter 1 Company Name VEOLIA ES TECHNICAL SOLUTIONS			U.S. EPA ID Number KS 0 0 0 0 3 3 6 8 9 1					
7. Transporter 2 Company Name SAVANNAH TRANSPORT			U.S. EPA ID Number TX D 0 0 0 8 3 8 8 9 6					
8. Designated Facility Name and Site Address VEOLIA ES TECHNICAL SOLUTIONS HIGHWAY 73 3.5 MILES W. OF TAYLOR'S BAYOU PORT ARTHUR, TX 77640			Facility's Phone: 409 736-2821					
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))		10. Containers		11. Total Quantity	12. Unit WL/Vol.	13. Waste Codes	
			No.	Type				
	X	1. NA3082, HAZARDOUS WASTE, LIQUID, n.o.s., (VINYL CHLORIDE, TRICHLOROETHENE), 9, III	1	DM	200	P	F002	D040 D043
	X	2. NA3082, HAZARDOUS WASTE, LIQUID, n.o.s., (VINYL CHLORIDE, TRICHLOROETHENE), 9, III	4	TP	10000	P	F037	OUTSIDE
		3.						
	4.							
14. Special Handling Instructions and Additional Information ER Service Contracted by VESTS - 1) ERG:171 W:71087 2) ERG:171 W:71087								
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.								
Generator's/Officer's Printed/Typed Name Karen Lail			Signature K. Lail			Month Day Year 13 14 15		
16. International Shipments <input type="checkbox"/> Import to U.S. Transporter signature (for exports only):			<input type="checkbox"/> Export from U.S. Port of entry/exit: Date leaving U.S.:					
17. Transporter Acknowledgment of Receipt of Materials								
Transporter 1 Printed/Typed Name Christine Brown			Signature Christine Brown			Month Day Year 10 31 15		
Transporter 2 Printed/Typed Name Myron Emmons			Signature Myron Emmons			Month Day Year 3 6 15		
18. Discrepancy								
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection								
Manifest Reference Number:								
18b. Alternate Facility (or Generator) U.S. EPA ID Number								
Facility's Phone:								
18c. Signature of Alternate Facility (or Generator) Month Day Year								
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)								
1. H040		2. H040		3.		4.		
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a								
Printed/Typed Name Alane Thomas			Signature Alane Thomas			Month Day Year 3 12 15		

GENERATOR

Land Disposal Restriction Notification Form

Generator Name SILTRONIC/PROJECT

EPA ID Number ORD096253737

Manifest 000966524VES

This notice is being provided in accordance with 40 CFR 268.7 to inform you that this shipment contains waste restricted from land disposal by the USEPA under the land disposal restriction program. Identified below for each container is the designation of the waste as a wastewater or non-wastewater, the Clean Water Act (CWA) permit status associated with the treatment/disposal facility, applicable waste codes and any corresponding subcategories, list of any F001-F005 solvent constituents that are present in the waste, and any underlying hazardous constituents (UHC) that are present.

Container Number: QI-2189459000-001 (1/ 1)

WIP / Approval Code: 071087 / PTA071087
Form Designation / CWA Status: Non-Wastewater / Non-CWA
Waste Codes (Subcategories): D040, D043, F002, F037
Constituents (F001 - F005): DISPOSAL SITE MONITORS FOR ALL CONSTITUENTS
UHCs Present: BENZENE, TOLUENE (NON F-LISTED)
Treatment Requirements: Restricted waste requires treatment to applicable standards.
Additional Notices:

Container Number: QI-2189459000-004 (1/ 2)

WIP / Approval Code: 071087 / PTA071087
Form Designation / CWA Status: Non-Wastewater / Non-CWA
Waste Codes (Subcategories): D040, D043, F002, F037
Constituents (F001 - F005): DISPOSAL SITE MONITORS FOR ALL CONSTITUENTS
UHCs Present: BENZENE, TOLUENE (NON F-LISTED)
Treatment Requirements: Restricted waste requires treatment to applicable standards.
Additional Notices:

I hereby certify that all information in this and associated land disposal restriction documents is complete and accurate to the best of my knowledge and information.

Signature

Justin J. Siltronic

Title

Env. Engineer

Date

3/4/15

4371184

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number O R D 0 9 6 2 5 3 7 3 7	2. Page 1 of 1	3. Emergency Response Phone (877) 818-0087	4. Manifest Tracking Number 000966522 VES			
5. Generator's Name and Mailing Address EILTRONIC/PROJECT 7286 NW FRONT AVE MAILBOX 50 ATTN: K LAIL PORTLAND, OR 97210			Generator's Site Address (if different than mailing address) SAME					
6. Transporter 1 Company Name WEST COAST MARINE CLEANING INC			U.S. EPA ID Number W A D 9 5 3 4 7 9 4 4 0					
7. Transporter 2 Company Name			U.S. EPA ID Number					
8. Designated Facility Name and Site Address CHEM WASTE MGT OF NORTHWEST 17629 CEDAR SPRINGS LANE ARLINGTON, OR 97813			U.S. EPA ID Number O R D 0 8 9 4 3 2 3 3 2					
Facility's Phone: 503 456-0817								
GENERATOR	9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes	
			No.	Type				
	1.	HAZ077, HAZARDOUS WASTE, SOLID, n.o.s., (TRICHLOROETHYLENE, BENZENE), 9 IN. HQ	1	C M	4	T	W001 F037	
	2.							
	3.							
4.								
14. Special Handling Instructions and Additional Information ER Service Contracted by VESTE - 1) ERG-171 W 747848 ARL OR323062 8400P								
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.								
Generator's/Offor's Printed/Typed Name Koreen Lail			Signature Koreen Lail			Month Day Year 3 6 15		
INT'L	16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: Date leaving U.S.:							
	Transporter signature (for exports only):							
TRANSPORTER	17. Transporter Acknowledgment of Receipt of Materials							
	Transporter 1 Printed/Typed Name John McAttee			Signature John McAttee			Month Day Year 3 6 15	
	Transporter 2 Printed/Typed Name			Signature			Month Day Year	
DESIGNATED FACILITY	18. Discrepancy							
	18a. Discrepancy Indication Space <input checked="" type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection Free liquid is ground water, solidify for ORCA disposal per Vince Brown/Debris quantity changed by driver Manifest Reference Number Jan 26 15							
	18b. Alternate Facility (or Generator)			U.S. EPA ID Number				
	Facility's Phone:							
	18c. Signature of Alternate Facility (or Generator)			Month Day Year				
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)								
1. H132		2.		3.		4.		
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a								
Printed/Typed Name Tina Weiser			Signature Tina Weiser			Month Day Year 3 6 15		

Name: SILTRONIC CORPManifest Doc. No.: 0009652UESNumber: OR325002

State Manifest No: _____

Is this waste a non-wastewater or wastewater? (See 40 CFR 268.2) Check ONE: Nonwastewater ☒ Wastewater ☐
 Identify ALL USEPA hazardous waste codes that apply to this waste shipment, as defined by 40 CFR 261. For each waste code, identify the corresponding subcategory, or check NONE if the waste code has no subcategory. Spent solvent treatment standards are listed on the following page. If F039, multi-source leachate applies, those constituents must be listed and attached by the generator. If D001-D043 requires treatment of the characteristic and meet 268.48 standards, then the underlying hazardous constituent(s) present in the waste must be listed and attached.

REF #	3. US EPA HAZARDOUS WASTE CODE(S)	4. SUBCATEGORY ENTER THE SUBCATEGORY DESCRIPTION. IF NOT APPLICABLE, SIMPLY CHECK NONE		5. HOW MUST THE WASTE BE MANAGED? ENTER LETTER FROM BELOW
		DESCRIPTION	NONE	
1	F037	organics		A
2	F037	metals		D
3	F037	cyanide		D
4	<u>F002</u>			<u>A</u>

To identify F039 or D001-D043, underlying hazardous constituent(s), use the "F039/Underlying Hazardous Constituent Form" provided (CWM-2004) and check here: ☐
 If no UHCs are present in the waste upon its initial generation check here: ☒
 To list additional USEPA waste code(s) and subcategory(s), use the supplemental sheet provided (CWM-2005-D) and check here: ☐
 Disposal facility monitors for all UHCs check here: ☐
 If waste will be managed in a system regulated under the CWA, or a Class 1 injection well under the SDWA check here: ☐

HOW MUST THE WASTE BE MANAGED? In column 5 above, enter the letter (A, B1, B3, B4, B5, B6, C, D or E) below that describes how the waste must be managed to comply with the land disposal regulations (40 CFR 268.7). Please understand that if you enter the letter B1, B3, B4, B5, B6, or D you are making the appropriate certification as provided below. (States authorized by EPA to manage the LDR program may have regulatory citations different from the 40 CFR citations listed below. Where these regulatory citations differ, your certification will be deemed to refer to those state citations instead of the 40 CFR citations.)

A. RESTRICTED WASTE REQUIRES TREATMENT

This waste must be treated to the applicable treatment standards set forth in 40 CFR 268.40.

For Hazardous Debris: "This hazardous debris is subject to the alternative treatment standards of 40 CFR 268.45."

B.1 RESTRICTED WASTE TREATED TO PERFORMANCE STANDARDS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the treatment standards specified in 40 CFR 268.40 without impermissible dilution of the prohibited waste. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

B.3 GOOD FAITH ANALYTICAL CERTIFICATION FOR INCINERATED ORGANICS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwastewater organic constituents have been treated by combustion in units as specified in 268.42 Table 1. I have been unable to detect the nonwastewater organic constituents despite having used best good faith efforts to analyze for such constituents. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

B.4 DECHARACTERIZED WASTE REQUIRES TREATMENT FOR UNDERLYING HAZARDOUS CONSTITUENTS

"I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 or 268.49, to remove the hazardous characteristic. This decharacterized waste contains underlying hazardous constituents that require further treatment to meet treatment standards. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

B.6 RESTRICTED DEBRIS TREATED TO ALTERNATE PERFORMANCE STANDARDS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and believe that it has been maintained and operated properly so as to comply with treatment standards specified in 40 CFR 268.45 without impermissible dilution of the prohibited wastes. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

C. RESTRICTED WASTE SUBJECT TO A VARIANCE

This waste is subject to a national capacity variance, a treatability variance, or a case-by-case extension. Enter the effective date of prohibition in column 5 above.

D. RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT FURTHER TREATMENT

For Hazardous Debris: "This hazardous debris is subject to the alternative treatment standards of 40 CFR Part 268.45."

E. WASTE IS NOT CURRENTLY SUBJECT TO PART 268 RESTRICTIONS

"I certify under penalty of law I have personally examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

E. WASTE IS NOT CURRENTLY SUBJECT TO PART 268 RESTRICTIONS

This waste is a newly identified waste that is not currently subject to any 40 CFR Part 268 restrictions.

I hereby certify that all information submitted in this and all associated documents is complete and accurate, to the best of my knowledge and information.

Signature: [Signature] Title: Env. Engineer
 1990 Chemical Waste Management, Inc. - 08/993 Form CWM-2005-C

Date: 3/6/15

SOLVENT

If the waste identified on the first page of this form is described by any of the following USEPA hazardous waste codes: F001, F002, F003, F004, F005, and all solvent constituents will not be monitored by the treater, then each constituent MUST be identified below by checking the appropriate box, and this page must accompany the shipment, along with the previous page of this form. If the waste code F039 describes this waste, then the corresponding list of constituents must be attached. If D001-D043 require treatment to 268.48 standards, then the underlying hazardous constituent(s) must also be attached.

SOLVENT WASTE TREATMENT STANDARDS²

F001 through F005 spent solvent constituents and their associated USEPA hazardous waste code(s).	Treatment Standard ¹		F001 through F005 spent solvent constituents and their associated USEPA hazardous waste code(s).	Treatment Standard ¹	
	Wastewaters	Nonwastewaters		Wastewaters	Nonwastewaters

¹ All spent solvent treatment standards are measured through a total waste analysis (TCA), unless otherwise noted. Wastewater units are mg/l, nonwastewater are mg/kg.

² For contaminated soils using the alternative soil treatment standards, the treatment standards for F001-F005 spent solvents must be a 90% reduction of constituents or less than 10 x the standards listed.

SUBCATEGORY REFERENCE

D001:

A. Ignitable characteristic wastes, except for the 40 CFR 261.21(a)(1) High TOC subcategory.

B. High TOC Ignitable characteristic liquids subcategory based on 40 CFR 261.21(a)(1) - Greater than or equal to 10% total organic carbon.

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number		2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number 000966528 VES	
		5. Generator's Name and Mailing Address		Generator's Site Address (if different than mailing address)			
Generator's Phone:		6. Transporter 1 Company Name WEST		U.S. EPA ID Number PA D y			
		7. Transporter 2 Company Name		U.S. EPA ID Number			
8. Designated Facility Name and Site Address				U.S. EPA ID Number			
Facility's Phone:				R D 6			
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes	
		No.	Type				
1.	1. M			1800 P			
2.							
3.							
4.							
14. Special Handling Instructions and Additional Information							
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.							
Generator's/Offor's Printed/Typed Name K. J. L.				Signature [Signature]		Month Day Year 3 6 1	
16. International Shipments		<input type="checkbox"/> Import to U.S.		<input type="checkbox"/> Export from U.S.		Port of entry exit: Date leaving U.S.:	
17. Transporter Acknowledgment of Receipt of Materials							
Transporter 1 Printed/Typed Name [Signature]				Signature		Month Day Year 6 1	
Transporter 2 Printed/Typed Name				Signature		Month Day Year	
18. Discrepancy							
18a. Discrepancy Indication Space		<input checked="" type="checkbox"/> Quantity		<input type="checkbox"/> Type		<input type="checkbox"/> Residue	
						<input type="checkbox"/> Partial Rejection	
						<input type="checkbox"/> Full Rejection	
18b. Alternate Facility (or Generator)				U.S. EPA ID Number			
Facility's Phone:							
18c. Signature of Alternate Facility (or Generator)						Month Day Year	
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)							
1.		2.		3.		4.	
20. Designated Facility Owner or Operator. Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a							
Printed/Typed Name				Signature		Month Day Year	

Land Disposal Restriction Notification Form

Generator Name SILTRONIC/PROJECT

EPA ID Number ORD096263737

Manifest 000966528VES

This notice is being provided in accordance with 40 CFR 268.7 to inform you that this shipment contains waste restricted from land disposal by the USEPA under the land disposal restriction program. Identified below for each container is the designation of the waste as a wastewater or non-wastewater, the Clean Water Act (CWA) permit status associated with the treatment/disposal facility, applicable waste codes and any corresponding subcategories, list of any F001-F005 solvent constituents that are present in the waste, and any underlying hazardous constituents (UHC) that are present.

Container Number: Q1-2189458000-001 (1/ 1)

WIP / Approval Code:	071129 / ARL CW1447
Form Designation / CWA Status:	Non-Wastewater / Non-CWA
Waste Codes (Subcategories):	F002, F037
Constituents (F001 - F005):	TRICHLOROETHYLENE
UHCs Present:	Not Applicable
Treatment Requirements:	Restricted waste requires treatment to applicable standards.
Additional Notices:	

I hereby certify that all information in this and associated land disposal restriction documents is complete and accurate to the best of my knowledge and information.

Signature Ken Sait

Title Env. Engineer

Date 3/6/15

439200

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number ORID 690253717	2. Page 1 of 1	3. Emergency Response Phone (877) 818-0037	4. Manifest Tracking Number 000966523 VES
5. Generator's Name and Mailing Address SILTECH/PROJECT 7300 NW FRONT AVE MAILBOX 56 ATTN: K LAM PORTLAND, OR 97210			Generator's Site Address (if different than mailing address) SAME		
Generator's Phone: 503 501-5018					
6. Transporter 1 Company Name VEOLIA ES TECHNICAL SOLUTIONS				U.S. EPA ID Number 31300000011260	
7. Transporter 2 Company Name				U.S. EPA ID Number	
8. Designated Facility Name and Site Address CHEM WASTE MGT OF NORTHWEST 17629 CEDAR SPRINGS LANE ARLINGTON, OR 97012				U.S. EPA ID Number ORID 080443102	
Facility's Phone: 541 454-0043					
GENERATOR	9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity
			No.	Type	12. Unit Wt/Vol.
	34	1. 11A3075 HAZARDOUS WASTE SOLID, n.o.s. (BENZENE, TRICHLOROETHYLENE) 9, III	1	DF 24	68
		2.		400 3-15-15	
		3.			
		4.			
13. Waste Codes					
					F002 F017
14. Special Handling Instructions and Additional Information ER Service Contracted by VESTS - 1) ERG 171 W-71129 ARL CT01447					
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.					
Generator's/Offoror's Printed/Typed Name Koreen Lail			Signature <i>Koreen Lail</i>		Month Day Year 3 4 15
INT'L	16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Transporter signature (for exports only): _____ Date leaving U.S.: _____				
	17. Transporter Acknowledgment of Receipt of Materials				
TRANSPORTER	Transporter 1 Printed/Typed Name Christine Brown			Signature <i>Christine Brown</i>	
	Transporter 2 Printed/Typed Name			Signature	
DESIGNATED FACILITY	18. Discrepancy				
	18a. Discrepancy Indication Space <input checked="" type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection <i>Quantity 31015 Container type changed per Chris Brown/Veolia 8-11-15</i>				
	Manifest Reference Number: _____				
	18b. Alternate Facility (or Generator) U.S. EPA ID Number				
	Facility's Phone: _____				
	18c. Signature of Alternate Facility (or Generator)				Month Day Year
	19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)				
	1. H132	2.	3.	4.	
	20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a				
	Printed/Typed Name Tina Weiser			Signature <i>Tina Weiser</i>	
				Month Day Year 3 4 15	

Land Disposal Restriction Notification Form

Generator Name SILTRONIC/PROJECT

EPA ID Number ORD096253737

Manifest 000966523VES

This notice is being provided in accordance with 40 CFR 268.7 to inform you that this shipment contains waste restricted from land disposal by the USEPA under the land disposal restriction program. Identified below for each container is the designation of the waste as a wastewater or non-wastewater, the Clean Water Act (CWA) permit status associated with the treatment/disposal facility, applicable waste codes and any corresponding subcategories, list of any F001-F005 solvent constituents that are present in the waste, and any underlying hazardous constituents (UHC) that are present.

Container Number QI-2189459001-001 (1/ 1)

WIP / Approval Code:	071129 / ARL CW1447
Form Designation / CWA Status:	Non-Wastewater / Non-CWA
Waste Codes (Subcategories):	F002, F037
Constituents (F001 - F005):	TRICHLOROETHYLENE
UHCs Present:	Not Applicable
Treatment Requirements:	Restricted waste requires treatment to applicable standards.
Additional Notices:	

I hereby certify that all information in this and associated land disposal restriction documents is complete and accurate to the best of my knowledge and information.

Signature

Jon Salfu Siltronic

Title

Env. Engineer

Date

3/4/15

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SHIPPING DOCUMENT		1 Generator ID Number ORD 096253737	2 Page 1 of 1	3 Emergency Response Phone (877) 818-0087	4 Shipping Document Tracking Number ZZ 00426577
5 Generator's Name and Mailing Address SILTRONIC CORPORATION 7200 NW FRONT AVE MAILBOX 50 ATTN K LAIL PORTLAND, OR 97210-5676					
Generator's Site Address (if different than mailing address) SAME					
6 Generator's Phone 503 219-7832					
6 Transporter 1 Company Name VEOLIA ES TECHNICAL SOLUTIONS				U.S. EPA ID Number NJ D 080631369	
7 Transporter 2 Company Name CHEMICAL WASTE MGMT OF NW				U.S. EPA ID Number ORD 089452353	
8 Designated Facility Name and Site Address CHEM WASTE MGT OF NORTHWEST 17629 CEDAR SPRINGS LANE ARLINGTON, OR 97812				U.S. EPA ID Number ORD 089452353	
Facility's Phone 541 454-2643					
GENERATOR	9a HM	9b U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10 Containers No. Type		11 Total Quantity
		1 NON HAZARDOUS MATERIAL	7 D M		4926
		2			P
		3			
		4			
13 Codes X004					
14 Special Handling Instructions and Additional Information ER Service Contracted by VESTS -/- 1) W 710387 ARL OR325643					
15 GENERATOR S/OFFEROR S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.					
Generator's/Offero's Printed/Typed Name Boren Lail					
Signature [Signature] Month Day Year 13 14 15					
TRANSPORTER	16 International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: Date leaving U.S.				
	17 Transporter Acknowledgment of Receipt of Shipment				
	Transporter 1 Printed/Typed Name Christine Brown				
Signature [Signature] Month Day Year 10 31 15					
Transporter 2 Printed/Typed Name Daniel E. Whitmore					
Signature [Signature] Month Day Year 03 18 15					
DESIGNATED FACILITY	18 Discrepancy				
	18a Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection				
	Shipping Document Tracking Number				
	18b Alternate Facility (or Generator) U.S. EPA ID Number				
	Facility's Phone				
18c Signature of Alternate Facility (or Generator) Month Day Year					
19 Report Management Method Codes (i.e. codes for treatment, disposal, and recycling systems)					
1 H132 2 3 4					
20 Designated Facility Owner or Operator Certification of receipt of shipment except as noted in Item 18a					
Printed/Typed Name Tina Weiser					
Signature [Signature] Month Day Year 13 19 15					

DESIGNATED FACILITY TO GENERATOR

3/20

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